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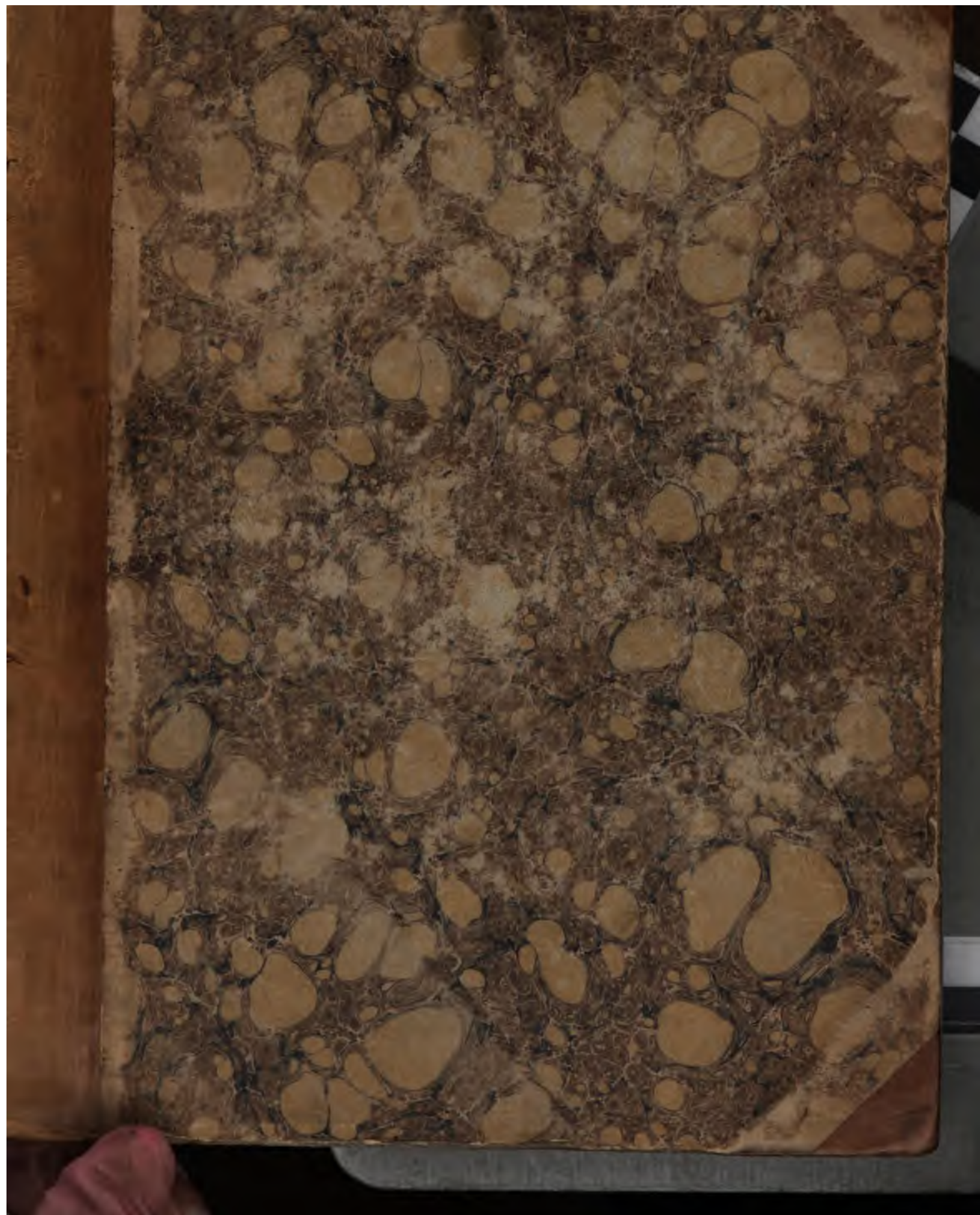
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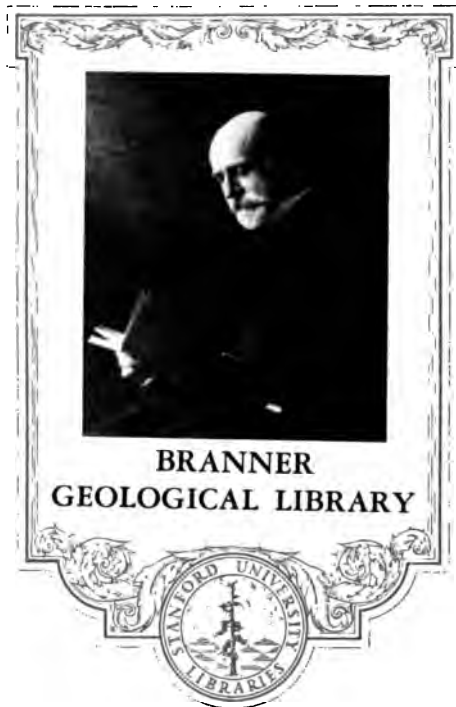
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PETRIFICATA DERBIENSIA.

—◆—
VOLUME I.
—◆—

PETRIFICATA DERBIENSIA;
OR,
FIGURES AND DESCRIPTIONS
OF
PETRIFACTIONS
COLLECTED
IN
DERBYSHIRE.

BY WILLIAM MARTIN, F. L. S.

CORRESPONDING MEMBER OF THE LITERARY AND PHILOSOPHICAL SOCIETY OF MANCHESTER,
AND HONORARY MEMBER OF THE GEOLOGICAL SOCIETY OF LONDON.

——— Vidi factas ex æquore terras:
Et procul à pelago conchæ jacuere marinæ.

OVID.

WIGAN,

PRINTED BY D. LYON;

SOLD BY WHITE AND CO., HORACE'S HEAD, FLEET-STREET, AND
LONGMAN, HURST, REES, AND ORME, PATERNOSTER-ROW,
LONDON; CONSTABLE AND CO., EDINBURGH; GILBERT
AND HODGES, DUBLIN; DEIGHTON, CAMBRIDGE;
AND THE AUTHOR, BUXTON.

1809.

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PREFACE.

A Part of the present volume was published some years ago, in detached numbers or *fasciculi*. Circumstances, in which the reader can take no immediate interest, prevented, at that time, the completion of the work.----It now appears in an entire form; and, I trust, will not be found to have suffered from the delay, with which it has unavoidably been attended.

“Derbyshire Petrifications” exhibited the only attempt that had then been made in England * to give coloured figures of extraneous fossils;—but abroad some extensive and highly finished works had previously shown an un-

* Number 1, of “Derbyshire Petrifications,” was published in 1794.

common degree of excellence, in such delineations.----These, as well as the beautiful plates in Mr. Parkinson's recent publication on organic remains*, prove how susceptible subjects of this kind are of that illustration from tinted drawings, which Naturalists, in general, have hitherto appropriated to their botanical and zoological labours.

As I am not an engraver by profession, it may not be improper to observe, that the present etchings have been entirely executed by my own hand.----This must be my apology, for their wanting a certain *neatness* and *uniformity* rarely found except in the works of the regular artist.----Accuracy of drawing is, however, the *first* requisite in plates appendant to descriptions of natural objects: the figures now given to the public are not, I hope, destitute of so essential a particular.

* The excellent drawings of Petrifications occasionally given in Mr. Sowerby's "British Mineralogy" ought also to be particularly noticed.

In the descriptive part of the work, the reader will perceive, my aim has been to apply to extraneous fossils the mode of investigation, happily established in Botany and Zoology. Hence, instead of giving a mere list of *names*, and these chiefly of species formed from entire genera or tribes of organic bodies*, I consider, in the first instance, every *genuine* or *permanent* fossil species to depend on a *single* recent one; and, accordingly, have endeavoured to fix the essential characters, by which it may hereafter be discriminated.

In arranging and describing petrifications on this plan, I have unavoidably been led to use certain distinctive *terms*, which either do not occur in works of this kind, or not exactly in the sense in which they are here employed—of these, it was at first my intention to have given an explanation in the present volume;

* V. Gmel. Syst. Nat. T. III. Append. p. 385. Also most other Systematic Arrangements of extraneous fossils.

together with a general statement of the principles, on which I conceive the study of extraneous fossils ought to be conducted: but I found, that the materials collected for this design, if joined to the following sheets, would extend the work far beyond its proposed limits. Hence these intended definitions of terms, &c., have been published in a distinct treatise, under the title of "*Outlines of an Attempt to establish a knowledge of extraneous fossils on scientific principles.*"---To that publication I beg leave to refer the reader for such information as may be necessary for the better understanding of the system and language now adopted *.

It remains to be observed, that the *synonyms* which ought to have followed the specific

* The reader's attention is, in particular, called to the sense in which we have employed the terms RELIQUIA, *Petrificata & Conservata*; HELMINTHOLITHUS, ERISMATOLITHUS; *Stirps, Stipes, &c.*; *Species*, permanent and temporary, marked by S. p. and S. t. at the end of the specific characters; *Families*, permanent and temporary; SOIL, *Seat, Tract, most ancient, ancient, less ancient, modern; Matrix, Nucleus, &c. &c.*

character of each petrification that has been heretofore noticed by authors, are for the present omitted.—It is my intention, if Providence allot me life and health, to publish another volume of “Figures,” &c.; and to give, at the end of it, in one general view, a systematic arrangement of all the species I shall then have described; with their *synonyms*, references to figures, and such additional remarks on each, as further research may enable me to make. In the mean time, any information on these subjects, particularly from Gentlemen who have collected the petrifications of Derbyshire, will be most thankfully received and acknowledged.

MACCLESFIELD, JUNE 1st, 1809.

TO THE
RIGHT HONOURABLE
SIR JOSEPH BANKS, BARONET, K. B.

MEMBER OF THE KING'S MOST HONOURABLE
PRIVY COUNCIL;
PRESIDENT OF THE ROYAL SOCIETY OF LONDON,
&c. &c.

THIS WORK,
ON THE EXTRANEOUS FOSSILS OF DERBYSHIRE,
IS,

WITH ALL POSSIBLE RESPECT,

DEDICATED,

BY HIS
OBEDIENT HUMBLE SERVANT,

WILLIAM MARTIN.

**MACCLESFIELD,
JUNE 1st, 1809.**

ADDENDA ET CORRIGENDA.

•• Many of the errata which follow have been occasioned by the Author's distance from the press—
for these, it is hoped, the circumstance now mentioned will plead an excuse.

In the Descriptions belonging to the Plates.

- PLATE 1, page 1, line 3, 4, for PHYTOLITHUS LYTHOXYLON (*Quercus*) &c. substitute the *specific character*, &c. given in the *systematical arrangement*, page 27.
—page 2, line 7, for liginous *r.* ligneous.
- P. 2, 3, 4, page 2, line 4, for Linnè *r.* Linné. This typographical error occurs frequently in the course of the work, which the reader will observe without its again being noted.—page 3, line 5, for waving *r.* having.—line 9, for *St. Cuthbert's r.* *Cuthbert's*.—page 4, line 15, for 8. Perpendicular section &c. *r.* 8. A supposed longitudinal section &c. It is necessary to observe, that we have never been able, by the most careful *artificial* section of the Entrochite, to detect the structure depicted in the figure just referred to, though we have repeatedly ascertained it, in specimens in which the constituent parts have been gradually separated by the slow but certain operations of nature. The figure, therefore, is merely an illustration of the structure *thus* ascertained.
- P. 5, page 1, line 5, for system *r.* principles.
- P. 6, page 1, line 3, for *flabelliformis r. nudus*.
- P. 11, 12, &c. page 2, line 12, for ferrugineous *r.* ferruginous.—page 3, line 7, for imbricate *r.* imbricated—Line 13, for *cancellatus r. cancellicaudex*.
- P. 15, 16, page 1, line 6, for S. t. *r.* S. p.
- P. 17, 18, page 1, line 3, for ERISMOLITHUS *r.* ERISMATOLITHUS.—Line 4, for line *r.* hinc.—page 2, line 8, for *cæspitosa r. cespitosa*; for Linnè, Linné.—Line 16, for ERRISMOLITHUS *r.* ERISMATOLITHUS.—page 3, line 13, for lammellæ *r.* lamellæ.
- P. 21, page 2, line 2, from bott. for vestage *r.* vestige.
- P. 22, 23, page 4, line 3, for semiorbiculatis *r.* semiorbiculatus.
- P. 27, 28. In a note, on the specific name of CONCHYLIO LITHUS *Mya ovalis*, we have observed that Dr. Pultney first established the difference between *Mya ovalis* and *Mya Pictorum*. Linn. This, however, is a mistake: Dr. Solander appears to be the first who applied the term *ovalis* to the shell which had, till then, been considered as the *Mya Pictorum* of Linnæus, and which, according to Dr. Matton and Mr. Rackett, ought still to be considered as such. Vide these Gentlemen's masterly paper on the British Testacea in the 8th Vol. of the Linnean Transactions.
- P. 32, 33, page 1, line 4, for decussatenu *r.* decussatim.—page 3, line 1, for cuneiform *r.* cuneiform.
- P. 35, page 1. In this and other parts of the work, where a reference is given to a System of Reliquia or extraneous fossils, as "(see Syst. Gen. 6, Fam. Ammonitæ.)" the Volume of "Outlines" is referred to.
- P. 38, 39, &c. page 2, line 15, for *Tisdewell r. Tideswell*.—page 3, Note *, for Whitehurst's *r.* Whitehurst's.—page 6, line 2 from bott. for arragement *r.* arrangement.
- P. 42, 43, 44, page 4, line 7, for romboidalis *r.* rhomboidalis.

- P. 45, 45 *, page 1, line 3, for *Derbyensis* r. *Derbiensis*.—page 3, line 9, for inversed r. invested.—pages 4, 5, lines 4, 15, for *Derbyensis* r. *Derbiensis*.
 P. 46, 47, &c. page 4, line 6, after *sulcatus* insert a colon.—line 8, for *magnâ* r. *magno*.—page 2, line 2, for *maximâ* r. *maximo*.
 P. 51, 52, page 1, line 4, insert (*costaticapsulis*) after the generic name.

The reader will observe that some few of the specific characters, at the head of the descriptions, vary from those given in the systematical arrangement at the end of the Vol. The latter are those which we consider as best adapted for discrimination.

In the Systematical Arrangement.

At the back of the titlepage, for Introduction r. "Outlines."

Page 2, line 2 from bott. for *rotundâ* *minutâ* r. *rotundo* *minuto*.—In the following line, for *quinquepartitâ* r. *quinquepartito*.

3, line 1, for *maximâ* r. *maximo*.

4, line 18, for *rotundâ* r. *rotundo*. In the following line, for *quinquepartitâ* r. *quinquepartito*.

5, line 13, for *micaceus* r. *micaceous*.

6, line 12, for *excavitis* r. *excavatis*.

7, line 1, del. n in *nucleus*—line 6 from bott. for *decussatem* r. *decussatim*.

9, line 6 from bott. for * d. d. * *Perforati*, *valvâ* &c. substitute * d. d. * *Perforati*, *valvâ* *utrâque* *convexâ*, *cardine* *valvæ* *plerumque* *majoris* *recto*, *patulo*, *secto* *inter* *nates* *foramine* *trigono*, *magno*.

10, line 19, for *magnâ* r. *magno*.—line 3 from bott. for *maximâ* r. *maximo*.

11, line 9, for *Anomitæ* r. *Anomite*.

19, line 13, for *Petit* r. *Petty*. Line 18, for *coraliorum* r. *coralliorum*.

21, line 11, for *Madreporetæ* r. *Madreporites*.—line 14, for *Affined* r. *Allied*.

22, line 1, for *VEGETABILIA* r. *VEGETALIA*.—See "Outlines."—line 16, for *pinna* r. *pinnae*.

24. In some observations on *PHYT. verrucosus*, Woodward's opinion respecting the nature of that fossil is stated, and a reference made to a specimen which he describes as exhibiting the appearance of a *branch* springing from the main stem, &c. Since those observations were written we have been obliged, by a particular friend, the Rev. J. Cumming, Fellow of Trin. Coll. Cambridge, with a communication on the subject, which it may be proper to lay before our readers. This Gentleman, at our request, examined the specimen above alluded to, now in the Woodwardian Collection; but, neither he nor Professor Hailstone, who most politely assisted in the examination, was able to detect the branching of the fossil, as seemingly described by Woodward. Hence, the opinion we have formed of the original of *P. verrucosus* receives no support from that of Woodward—at least as far as *that opinion* depends on the specimens of his collection.

*. The Author here begs leave to express his regret that the letter-press of the present work, as well as a large part of that of his "OUTLINES," had been printed off before Mr. Parkinson's second Volume of Organic Remains had made its appearance;—hence he has not had an opportunity of availing himself of some just views which that Gentleman has there taken of the subject of extraneous fossils; and which at once prove him not only an acute reasoner, but also a most excellent practical naturalist. Vide his correct enumeration and descriptions of the various *Pentacrinite* and *Entrochite* hitherto discovered—the experiments by which he determined the existence of membranous matter in the animal petrification, &c. &c.

AN ARRANGEMENT

OF THE

Petrifactions, &c. (Vol. 1.)

According to the GEOLOGICAL RELATIONS of the inclosing Strata.

Ord. I. RELIQUIA VETUSTA. Ancient organic remains.

Imbedded in the constituent strata of *Ancient Secondary Soils*.
(V. "Outlines." p. 158. 179.)

Fam. 1. In limestone tracts.

- Entomolithus *derbiensis*. T. 45. f. 1. 2. T. 45*. f. 1. 1.
- Helmintholithus Entr. *laevis*. T. 2. f. 1. 2. 3. 4. T. 3. f. 5. 6. 7. 8. T. 24. f. 12.—*prominens*. T. 4. f. 9.—*verrucosus*. T. 4. f. 10.—*annulatus*. T. 4. f. 11. 12.
- Conchylolithus Arc. *cancellatus*. T. 44. f. 7.—*rostratus*. T. 44. f. 6.
- Conchylolithus Anom. *giganteus*. T. 15.—*crassus*. T. 16.—*semireticulatus*. T. 32. f. 1. 2. 3. T. 33. f. 4.—*punctatus*. T. 37. f. 6. 7. 8.—*aculeatus*. T. 37. f. 9. 10.—*scabriculus*. T. 36. f. 5.—*productus*. T. 22. f. 1. 2. 3.—*trigonalis*. T. 29. T. 36. f. 1.—*triangularis*. T. 36. f. 2.—*striatus*. T. 23. f. 1. 2.—*subconicus*. T. 47. f. 6. 7. 8.—*cuspidatus*. T. 46. f. 3. 4. T. 47. f. 5.—*auctus*. T. 49. f. 15. 16.—*rotundatus*. T. 48. f. 11. 12.—*glaber*. T. 48. f. 9. 10.—*resupinatus*. T. 49. f. 13. 14.—*lineatus*. T. 36. f. 3.—*acuminatus*. T. 33. f. 5. 6. T. 32. f. 7. 8.—*Pugnus*. T. 22. f. 4. 5.—*Crumena*. T. 36. f. 4.—*saculus*. T. 46. f. 1. 2.
- Conchylolithus Pinn. *nudus*. T. 6. f. 1. 2.
- Conchylolithus Naut. *sphaericus*. T. 7. f. 3. 4. 5.—*hiulcus*. T. 40. f. 1. 2.—*Listeri*. T. 35. f. 3.—*Woodwardii*. T. 35. f. 4. 5.—*ingens*. T. 41. f. 5.—*Gesneri*.—T. 38. f. 1. 2.—*Breynii*. T. 39. f. 4.
- Conchylolithus Turb. *constrictus*. T. 38. f. 3.
- Conchylolithus Helic. *auricularis*. T. 40. f. 3. 4.—*Catillus*. T. 7. f. 1. 2.
- Erismatolithus Tubip. *catenatus*. T. 42. f. 1. 2.—*radiatus*. P. 18. f. 2. 3.
- Erismatolithus Madrep. *duplicatus*. T. 30. f. 1. 2.—*floriformis*. T. 43. f. 3. 4. T. 44. f. 5.—*Madrepore cespitosæ*. T. 17.—*affinis*. T. 31. f. 1.
- Erismatolithus Millep. *flustriformis*. T. 43. f. 1. 2.

Fam. 2. In the shale tract following the limestone*.

- Entomolithus *derbiensis*. T. 45. f. 1. 2. T. 45*. f. 1. 2. Rare.

* The reader will find a general account of the mineral tracts of Derbyshire, in an appendix to the present Volume, shortly to be published.

Conchylolithus Naut. *Gesneri*. T. 38. f. 1. 2.—*Breynii*. T. 39. f. 4.—rare.

Conchylolithus Relic. *Catillus*. T. 7. f. 1. 2.—rare.

Ord. II. RELIQUIA VETULA. Less ancient organic remains.

* *Stratigena*. Stratigenous.

Imbedded in the constituent strata of *Less Ancient Secondary Soils*. (V. "Outlines." p. 159. 180.)

Fam. 1. In the millstone-grit tracts.

Phytolithus Plant. *verrucosus*. T. 11. f. 1. T. 12. f. 2. T. 12*. rare in this tract.

Phytolithus *acutulinus*. T. 2. 1. f. 1. 2. 3. &c. very rare.—*sulciculmis*. T. 8. f. 1. —*striaticulmis*. T. 25. f. 1. T. 26. f. 2. rare.—*cancellicaudex*. T. 13. f. 3.—*corticiradix*. T. 9. f. 2. 3.—*compressiradix*. T. 9. f. 4. The siliceous gritstone which follows the shale tract is generally considered as unproductive of vegetal remains—we have, however, detected the foregoing species in it.

Fam. 2. In carboniferous and ferriferous tracts.

Entomolithus *lunatus*. T. 45. f. 4.

Conchylolithus *Mya ovalis*. T. 27. f. 1. 2. T. 23. f. 5.

Conchylolithus Hel. *pusillus*. T. 52. f. 3.

Phytolithus Fil. *striatus*. T. 10. f. 1. 2. 3. 4.—*pseudoregalis*. T. 19. f. 1. 2. 3. T. 34. f. 3.—*auriformis*. T. 34. f. 1. 2.

Phytolithus Plant. *verrucosus*. T. 11. f. 1. T. 12. f. 2. T. 12*. f. 2.—*imbricatus*. T. 14. f. 4. 5. T. 50.—*stellatus*. T. 20. f. 4. 5. 6.

Phytolithus *acutulinus*. T. 21. f. 1. 2. 3. 4. 5. 6.—*costaticapsulis*. T. 51. f. 1. T. 52. f. 2.—*sulcicapsulis*. T. 26. f. 3.—*sulciculmis*. T. 8. f. 1. *striaticulmis*. T. 25. f. 1. T. 26. f. 2.—*cancellicaudex*. T. 13. f. 3.—*corticiradix*. T. 9. f. 23. *compressiradix*. T. 9. f. 4.

** *Venigena*. Venigenous.

Found in the veins of *Ancient Secondary Soils*. (V. "Outlines." p. 179 Note ††.)

Conchylolithus Naut. *Luidii*. T. 35. f. 1. 2.

Ord. III. RELIQUIA RECENTIA. Modern organic remains.

Imbedded in *Modern Soils* (v. "Outlines." p. 162,) and sometimes in the fissures of the *Ancient* and *Less Ancient* secondary strata.

Incrustation. T. 5.

Phytolithus *guernilignis*. T. 1.



PLATES AND DESCRIPTIONS.



PLATE 1. *

PETRIFIED WOOD. WOODSTONE.

PHYTOLITHUS LYTHOXYLON (*Quercus*) texturâ ligni querni. S. t.

Petrified wood ; the original apparently oak.

Not very common in Derbyshire : specimens occur now and then in our gravel pits, and in the water-courses of our lead-mines, &c. but they are by no means frequent—They have also been found bedded in clay, near *Eyem*, at a considerable depth in the limestone strata—It should be remarked, however, that the clay, in this instance, did not form a regular stratum ; it was merely lodged in perpendicular cavities or fissures communicating with the surface, through which the adventitious vegetable matter had, in all probability, been introduced.

The specimen represented in the adjoining plate was sawn from a large trunk-like body of petrified wood discovered several years ago, near *Ashford*, on clearing an old *mel* † ; where the original seemingly had been placed as a prop for the support of some part of the roof. Its

* The figures, in each plate, the size of the specimens, except where the contrary is noted.

† An horizontal Perforation through the side of a hill, &c. for the purpose of carrying off the water from the neighbouring mines.

PLATE 1.

constituent substance is siliceous: the colour, externally, yellowish brown; internally, blackish grey, blotched and radiated with brown and white. Fracture somewhat slaty; fragments sharp (3. Kirwan.); texture * fibrous. The dark parts opaque (1. Kirwan); the white semitransparent (2. Kirwan); the latter much finer in texture than the former, with a structure less evidently lignious—The lighter parts appear to pass into calcedony.

The face of the specimen exhibits a transverse section of the original trunk: its figure triangular; two-thirds of the circle it would otherwise have formed, having been broken off in the sawing—The annual rings and radial insertions are beautifully and distinctly marked; more so than in any other fossil of this kind which has yet come under my examination.

All the petrified wood hitherto collected in this county, appears to have been oak, and the constituent matter constantly the same as that of the piece now figured—Holzstein or Woodstone of the German mineralogists. (Kirwan. Min. E. 2d. 315.)

* Should not some distinction be observed between the *texture* and the *fracture* of a fossil? Mineralogists of the German school seem to consider the terms as synonymous.

PLATE 2, 3, 4.

ENTROCHITÆ. CHERT AND LIMESTONE.

FIG. 1, 2, 3, 4, 5, 6, 7, 8.

HELMINTHOLITHUS ENTROCHITES (*lævis*) stipite
articulis æqualibus: ambitibus lævibus planis, ramis
alternis articulatis. S. p.

A fossil worm—the original an *Entrochus*—Stipe cylindrical; the joints equal; their ambits even, and flat. The branches or lateral arms (in such specimens as retain them) alternate, slender, tapering, and jointed like the stipe.

The most general of the Derbyshire Petrifications. It occurs, more or less, throughout our Limestone; but particularly near *Monyash* and *Bakewell*, where the strata appear, in some places, almost wholly composed of fragments of this and other Entrochitæ *.

* These bodies exhibit a great variety of *forms*—But the *species* are not so numerous as a casual observer would suppose. The structure of the *Entrochus* is complicated when compared with that of shells and other *exuviae*: and hence, the petrifications of the same species differ in figure, according as the various parts of the original have been more or less perfectly preserved. I have endeavoured to reduce these merely accidental varieties into some order—perhaps this might have been done with greater accuracy, had I been more successful in my search after entire specimens; but it is particularly worthy of notice, that notwithstanding the prodigious quantity of the stems found in this county, the head or body of the animal has very rarely been met with.

PLATE 2, 3, 4.

FIG. 1. The stipe of the *even Entrochite*, as commonly found in Derbyshire *. *a. a.* small angular dints or cavities, in which the arms were inserted in the original.

This fossil has generally been considered as the remains of the *Isis Entrocha* of Linnè; but if the characters of that animal are correctly given in the last edition of the *Systema Naturæ* (p. 3794. n. 4.) the prototype of our *Entrochite* is certainly a distinct species. The arms or branches in the *Isis Entrocha* are particularly described as being verticillate, dichotomous, and continuous or not jointed; in the present

* All the Derbyshire *Entrochitæ* I have yet collected agree in the following particulars.

The stem is columnar, jointed, perforated longitudinally through the centre, and in most instances furnished with lateral arms or branches.

The disks, or internal surfaces of the joints by which they are united to one another, are flat and radiated with close slender striæ, drawn from the centre to the margin: the radiations of each joint tally with those of the next with which they are in contact; and, thus joined, the extremities of the striæ form minutely crenulated lines, encircling the stem, and externally marking out the several commissures. On the inside, the joints are pulley-shaped, or like a small wheel surrounded by a deep, angular groove or furrow. When the joints are entire the grooves are filled and hidden by the ambits, which collectively constitute the external surface of the stem.

The central perforation of the joints is produced by the total or partial removal of five tubular filiform bodies, closely surrounding a sixth, of a similar shape and structure. These are bound together, as it were, by small, transverse, circular, equidistant, plate-like parts, (vide fig. 5, 6, 8) which divide with the commissures of the stem, but are rarely visible, except in such specimens as have lost more or less of the exterior coverings.



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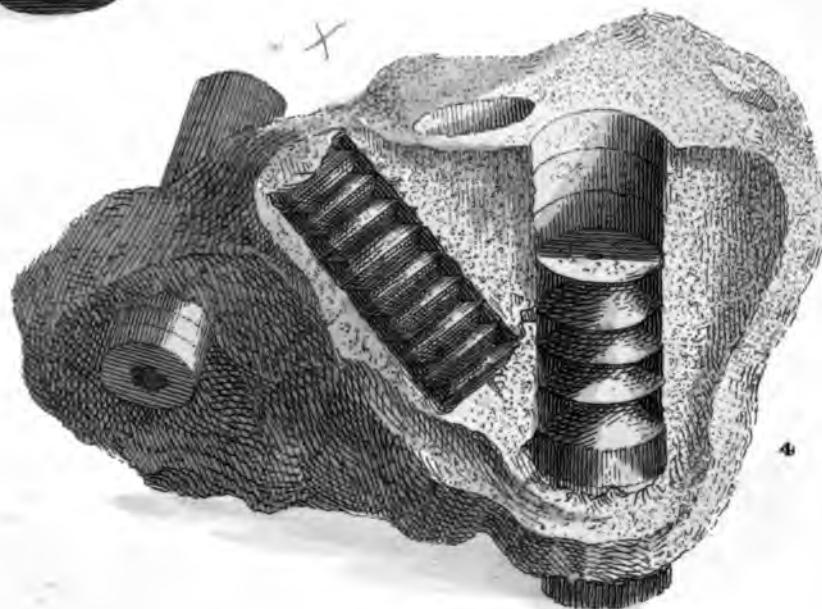
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3

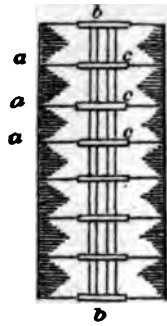


T. 2.



4

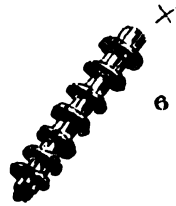
7.3.



8



5



6



7

PLATE 2, 3, 4.

fossil they are always alternate, never forked or dichotomous, and constantly jointed in the same manner as the stem.

H. E. levis has also been confounded with an *Entrochite*, which resembles it in some particulars, but differs in waving the stipe conical, with concavo-convex joints—This latter Species is common in some parts of England, but has not, as yet, been found in Derbyshire.

2. Joints broken from *H. E. levis*. *St. Cuthberd's beads*. The joints are always longer or deeper in proportion to the decrease of their diameter: in *Entrochite*, about one-fourth the thickness of the specimen above described (fig. 1.) the joints are frequently half an inch long; on the contrary, in specimens more than two inches in diameter, which I have met with, the articulations do not exceed in depth the thickness of a shilling.

3. Fragments of the arms or lateral branches. These are rarely found adhering to the main stem.

4. The common *even Entrochite*, when the outer coat is destroyed. Generally found in cylindrical cavities, as represented in the figure. The matrix commonly chert. Specimens of this kind are distinguished by the title of *Screw-stones*, in Derbyshire.

PLATE 2, 3, 4.

6. Small tubular bodies, united by transverse plates, forming the central part of the Entrochite. These probably served as a kind of ligament, in the recent animal, by which the joints were connected. They are found thus divested, in cavities occasioned by the removal of the exterior parts of the stipe. Specimens are not unfrequent in which this removal has but partially taken place. In these the tubes are generally chert, the outer parts of the Entrochite spar, and the matrix to the whole chert.

5. Less perfect specimens of these tubular bodies in brown chert.

7. Specimen of the common Derbyshire grey marble; the figures in which are produced by various sections of the Entrochite.

8. Perpendicular section of an Entrochite, in order to shew the internal structure and disposition of the parts above described. *a. a. a.* point out the different commissures; *b. b.* the ligament, which runs through the centre of the stem; *c. c. c.* the transverse plates, by which the cylindric tubes, forming the ligament, are connected. The white parts of the figure show the internal pulley-shaped structure of the joints; the black, the outer coat, or that part which fills up the groove of each joint, and constitutes the ambit.

PLATE 2, 3, 4.

FIG. 9.

HELMINTHOLITHUS ENTROCHITES (*prominens*)
stipite articulis æqualibus: ambitibus rotundatis lævi-
bus, ramis alternis. S. p.

Differs from the foregoing species, in the ambits of the joints being somewhat prominent and rounded. The branches are alternate; but I have not found them, in a sufficiently perfect state, to determine, whether they are jointed or not.

Found with the above.

FIG. 10.

HELMINTHOLITHUS ENTROCHITES (*verrucosus*)
stipite articulis æqualibus: ambitibus rotundatis tu-
berculatis, ramis ——. S. p.

Differs from the species last described, in having the ambits of the joints studded with a single row of tubercles or small wart-like bodies. The structure of the arms or branches uncertain.

Not common. I have met with a few imperfect specimens about *Buxton*: that from which the figure is taken, was found near *Bakewell*.—Limestone.

PLATE 2, 3, 4.

FIG. 11, 12, 13.

HELMINTHOLITHUS ENTROCHITES (*annulatus*)

stipite articulis inæqualibus: ambitibus lævibus,
caput versùs alternè planis rotundatisque, ramis

——. S. p.

The joints of the stipe in this species are unequal: the ambits smooth; towards the head or body alternately flat and convex. Near the base or lower extremity of the stipe, six, eight, or more, of the flat-edged joints, intervene between single ones, with a prominent and rounded form.

Found with the other species.

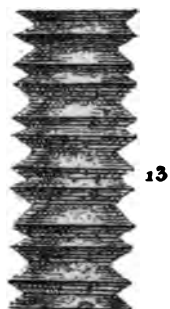
FIG. 11. A specimen of the upper part of the stipe, with the ambits of the smaller joints flat, those of the larger convex.

12. Differs in having the larger joints flat, the smaller prominent.

This last specimen appears to be only the remains of the arms or branches of the stem.

13. The pully-shaped stipe this species forms when its outer coat is destroyed.

T. 4.



T.S.



PLATE 5.

AN INCRUSTATION. CALCAREOUS EARTH.

Organized bodies, incrustated with fossil matter, have been arranged with petrifications by various authors, and in a part of this work, formerly given to the public, they were ranked as such. The system we have at present adopted will not allow of this. The annexed plate, however, exhibiting a very singular specimen of calcareous incrustation, it has been thought expedient to retain, as an example of the mode nature at present pursues, in surrounding animal and vegetable substances with a mineral matrix—The first step towards petrification.

Calcareous incrustations are frequent in Derbyshire: they are found in all those streams and rivulets which run over limestone; where they are daily formed by the deposition of calcareous earth on moss, bones*, &c. The skull, from which the present drawing was made, was found in a different situation.—Some miners employed on a *level*, near *Bakewell*, had followed, from the beginning of their work, the course of a small natural fissure in the rock, through which they were *driving*. After proceeding a few yards, they came to a *fault*, or sudden division in the limestone, forming a kind of cave, several yards deep; at the bottom

* Most of the petrified bones of land animals described by authors, are merely incrustations.

PLATE 5.

of which they discovered the incrustated head now delineated, with other bones*, in the same state, all apparently belonging to animals of the cat-kind †.

FIG. 1. is a side view of the head—The incrustation of a light yellow, or buff-colour: its texture firm and strong. The teeth and one side of the upper jaw are bare. The grinders perfect; the fore-teeth lost; the canine teeth remarkably large and strong, the enamel still on them.

2. Front view of the same specimen.

It will, perhaps, be impossible satisfactorily to account for the bones being deposited in the situation above described. Some degree of probability, however, attaches itself to the supposition, that all caves in which similar accumulations of bones have been discovered, were, at some former period, the habitation, or occasional places of retreat, of the animals whose remains they now entomb.

* Caverns containing incrustated bones have been discovered in almost every part of Europe. In the 5th vol. of the Transactions of the Linnean Society, Mr. Gibbes has given an account of one lately observed in Somersetshire, containing a considerable accumulation of human bones!

† The skull has been thought too large for that of the cat; but the form and number of teeth incontestably prove it to belong to the feline tribe. And as the wild-cat, which, according to Mr. Pennant and other Zoologists, is considerably larger than the domestic kind, was once, it is well known, common in Derbyshire, there is little doubt but the present specimen owes its form to the animal in question.

PLATE 6.

PINNITE. LIMESTONE.

FIG. 1, 2.

CONCHYLIOLITHUS PINNITES (*flabelliformis*) subflabellatus longitudinaliter sulcatus: sulcis æqualibus rectis: interstitiis rotundatis lævibus. S. p.

A petrified shell—The original a *Pinna*. Somewhat fan-shaped. Beaks pointed. Opposite extremity very broad and rounded. Surface sulcated in a longitudinal direction; the *sulci* equal, and straight; the intervening spaces rounded and smooth.

Rare. I have met with specimens near *Burton* and *Bakewell*, but none very perfect. Those exhibited in the annexed plate were found near *Ashford*. They constitute part of a mass of limestone, three or four times larger than the drawing.

FIG. 1. The more perfect of the specimens. The beaked end broken. The surface divided by a diagonal fracture in the limestone.

2. A smaller fragment.

When these, and some other specimens of the same shell, first came under my examination, I considered them as the remains of the great, rough, sulcated *Pinna*, (*Pinna nobilis*

PLATE 6.

of *Linne*) which they resemble in form and in the furrows of the surface. The want of the scales and processes, with which that species is roughened, was attributed to the specimens being merely *nuclei*, or casts, consequently retaining only the internal shape of the original. An attention to this fossil, whenever opportunity offered it for observation, has induced me to alter this opinion. I am inclined now to believe, that all the specimens I have yet seen, display the external surface and marks of their prototype, and that this is not any species of *Pinna*, at present known in a recent state.



1



PLATE 7.

UNIVALVE SHELLS. LIMESTONE.

FIG. 1, 2.

CONCHYLIO LITHUS HELICITES (*Catillus*) depressus, subtùs planus, suprà concavus contractior, ambitu obtuso lato obliquo: marginibus acutis.
S. p.

A fossil shell—The original an *Helix*—Depressed; beneath nearly flat; above concave, somewhat contracted; crossed with oblique striæ. The volutions about three. The ambit, or back of the outward whirl, broad, convex, oblique, transversely striated, and bordered on each side by a sharp edge or margin.

This species is pretty frequent—It is to be met with in the limestone near *Tideswell*, *Winster*, and other places—And I have lately observed it at *Buxton*, very much flattened or compressed, in the shale, which interposes between the limestone and gritstone strata of this county.

FIG. 1. Full view of the concave or dish-like side. This, as above remarked, is smaller or more contracted than the opposite side of the shell. Hence, its margin, when viewed as in the present figure, has the appearance of a sharp ridge down the centre of the outward volution.

PLATE 7.

2. The same specimen in a different position, showing the back.

Conch. H. Catillus has been mistaken for an *Ammonite*; but it is entirely destitute of the chambered structure, which characterises that kind of fossil shell.

FIG. 3, 4, 5.

CONCHYLIO LITHUS NAUTILITES (*sphaericus*) globosus umbilicatus, ambitu integro, aperturâ coarctatâ, dissepimentis dentato-sinuatis. S. p.

Petrified shell—Original a *Nautilus*—Involute, globular, umbilicate. Navel deep and circular. Ambit entire, convex. The aperture, or mouth of the shell, narrow, contracted. Dissepiments dentato-sinuated. The siphunculus, or pipe of communication, placed beneath, close on the back of the succeeding whirl. Its structure complicated—In each dissepiment two small lateral hollows or cavities, in form similar to the siphunculus, with which they seem to have been connected.

This elegant fossil is not uncommon in limestone, but rarely occurs in as perfect a state as the specimen represented by our drawing. In general, the dentated sutures, which externally mark the several dissepiments, are faint

PLATE 7.

or obsolete: and the structure of the siphunculus and chambers, very seldom apparent. A less globular variety of this shell is frequent in the light coloured limestone, near *Burton* and *Castleton*.

FIG. 3. Shows the specimen placed on one side.

4. The back of the outward whirl.

5. The end of the outward whirl, broken off at one of the partitions. *a.* the siphunculus. *b. b.* the lateral cavities. The substance of this specimen a greyish black Swinestone.

PLATE 8, 9.

VEGETABLE REMAINS. ARGILLACEOUS GRITSTONE.

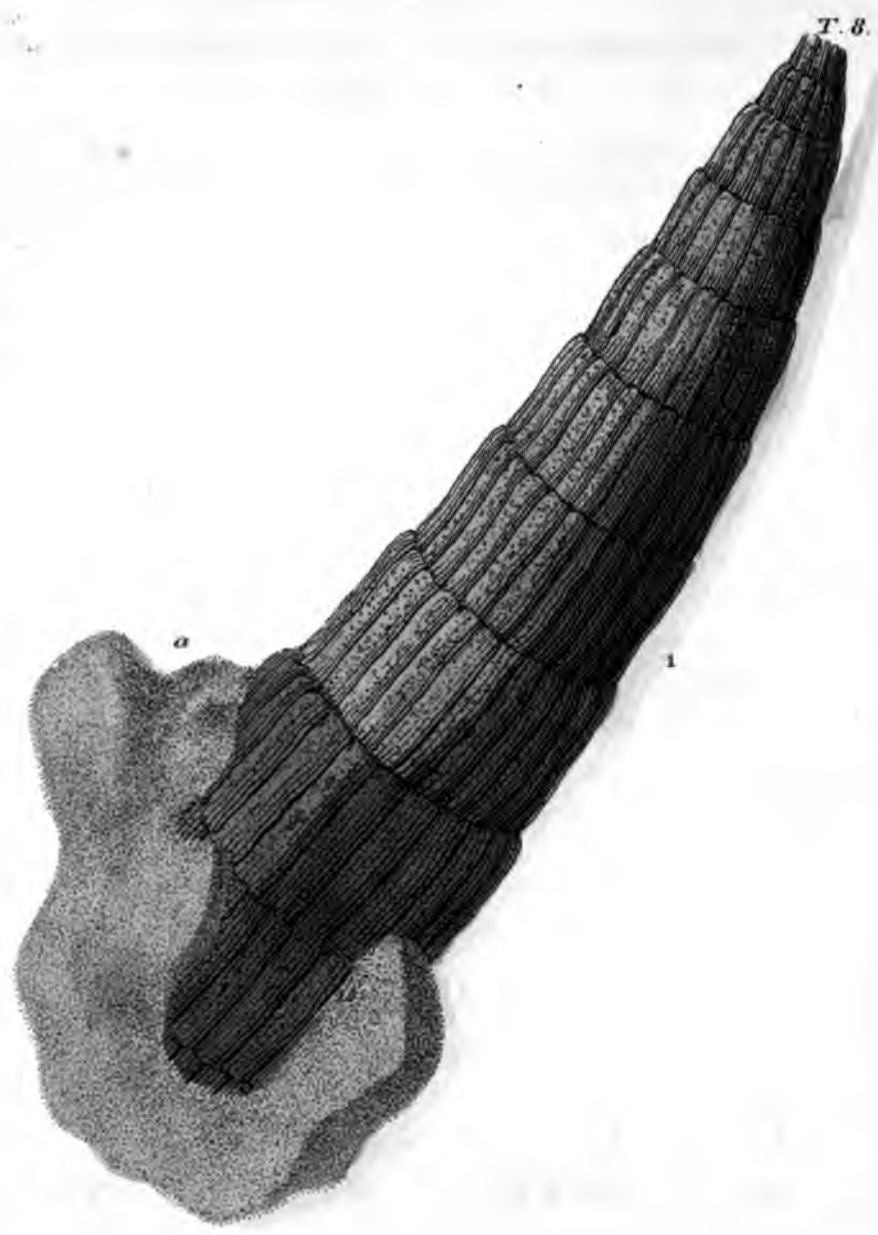
FIG. 1.

PHYTOLITHUS (*sulcatus*) GRAMINIS? trunci, cylindrici simplicis: articulis longitudinaliter sulcatis. S. t.

A fossil vegetable—Original the trunk or *culm* of a grass? Cylindric (tapering towards the summit) simple, with short, longitudinally sulcated or furrowed joints. The furrows equal and distant.

Very common in Derbyshire: it is found in all the upper strata productive of coal, particularly near *Wingerworth*, *Chesterfield*, *Alfreton*, &c. It lies in various directions in the stone, coal, or shale, and may frequently be traced to the length of three or four feet; though it seldom happens that more than a few inches can be got perfect, from the surrounding substance. Its usual thickness is about that of the specimen represented in the adjoining plate.

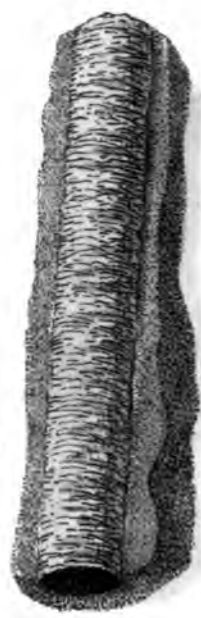
Mr. Whitehurst, in his account of the Derbyshire strata, has noticed this fossil as the remains of the *Indian Bamboo*. It probably owes its form to one of the *Grasses*—perhaps an *Arundo*—but it agrees with no species I have seen. It is well known to Botanists, that most of the larger *Gramina* in the Indies have branched culms—The structure of this petrification is simple, or destitute of branches; and it does not appear that the original has, as yet, been discovered.



T. 9.



4

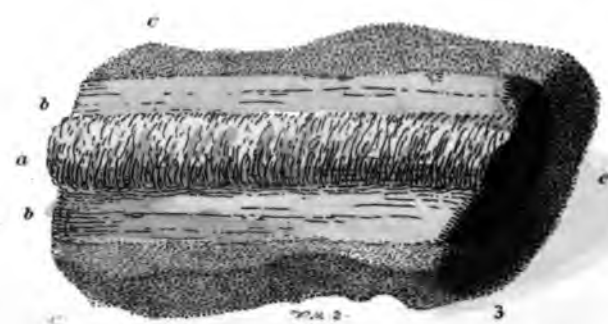


a

a

a

a



b

a

b

c

PLATE 2

3

PLATE 8, 9.

FIG. 1. A specimen of the top, or upper part of the culm. Gritstone. *a.* part of the stone remaining in which it was lodged.

FIG. 2, 3.

PHYTOLITHUS (*corticatus*) Radicis? teretis simplicis transversim rugatæ, cortice crassâ æquâ obductæ. S. t.

A fossil vegetable. The original a root? consisting of an inner part, which is columnar, simple, and transversely wrinkled, and an outward bark or covering, very thick and even, or not wrinkled. The inner wrinkled part frequently found divested of its exterior covering.

Common in gritstone with the foregoing.

FIG. 2. A specimen without the coat or bark. *a. a.* a part of the gritstone which surrounded it.

3. With the bark remaining on one side. *a.* the inner wrinkled part. *b. b.* the outward coat. *c. c. c.* part of the matrix in which the specimen was found.

PLATE 8, 9.

FIG. 4.

PHYTOLITHUS (*compressus*) Radicis? simplicis columnaris compressæ, longitudinaliter rugatæ. S. t.

A fossil vegetable. The original a *root*; simple, columnar, compressed and longitudinally wrinkled.

The compressed form of this petrification appears to have been received from the original; the species last described, being found in the same stone perfectly round.

Frequent in gritstone. The specimens, fig. 2, 3, and 4, were collected from a small quarry between *Burton* and *Leek*. I have lately met with much larger specimens, near *Chapel-in-the-Frith*.

PLATE 10.

FERN. IRONSTONE.

FIG. 1, 2, 3, 4.

PHYTOLITHUS FILICITES (*striatus*) fronde bipinnatâ: pinnis ovato-oblongis: pinnulis lanceolatis integerrimis: nervis simplicibus confertis transversis.
S. p.

A fossil or petrified vegetable. The original a *Fern*—Fronde bipinnate. Pinnæ ovato-oblong, alternate. Pinnules* lanceolate, very entire, alternate. Nerves simple (not dichotomous) crowded, transverse, imparting to the surface of the frond a closely striated appearance. A deeply impressed midrib runs down the centre of the pinnæ and each of the pinnules. The stipe appears to be (in such specimens as exhibit it) cylindric and longitudinally striated.

Found near *Chesterfield* and *Alfreton*—Sometimes in the coal-shale; but more frequently, and in better preservation, in the nodules of ironstone, abounding in the way-

* It should be observed, that the subdivisions of the *pinnæ*, in general, extend down to the midrib: in some specimens, however, they are not divided quite so deeply; in this case Botanists would describe the subdivisions as lobes or segments, rather than as pinnules, and the frond, as *almost* bipinnate.

PLATE 10.

boards, or thin beds of indurated clay, which separate the different strata of coal and gritstone. The original of this fossil seems to have been a very large species: I have never yet met with an entire frond; but nodules are not uncommon in which a part of the main stem or stipe is preserved. These specimens, in some degree, enable an attentive observer to ascertain the size of the plant in its recent state; and, as they frequently contain small portions of the pinnæ adhering to the stipe, they also determine its bipinnate structure.

This *Filicites* has been considered as one of those which owe their form to the American ferns; but it does not appear, as far as I am enabled to judge, that the recent species has been satisfactorily pointed out by any of the writers on these subjects.

- FIG. 1. A nodule of Ironstone holding a pinna or leaflet.
2. A smaller nodule holding a similar pinna.
3. A small nodule holding a single pinnule or segment. Nodules of this kind frequent.
4. A nodule containing part of the stipe or stem.

T. 10



Tu.

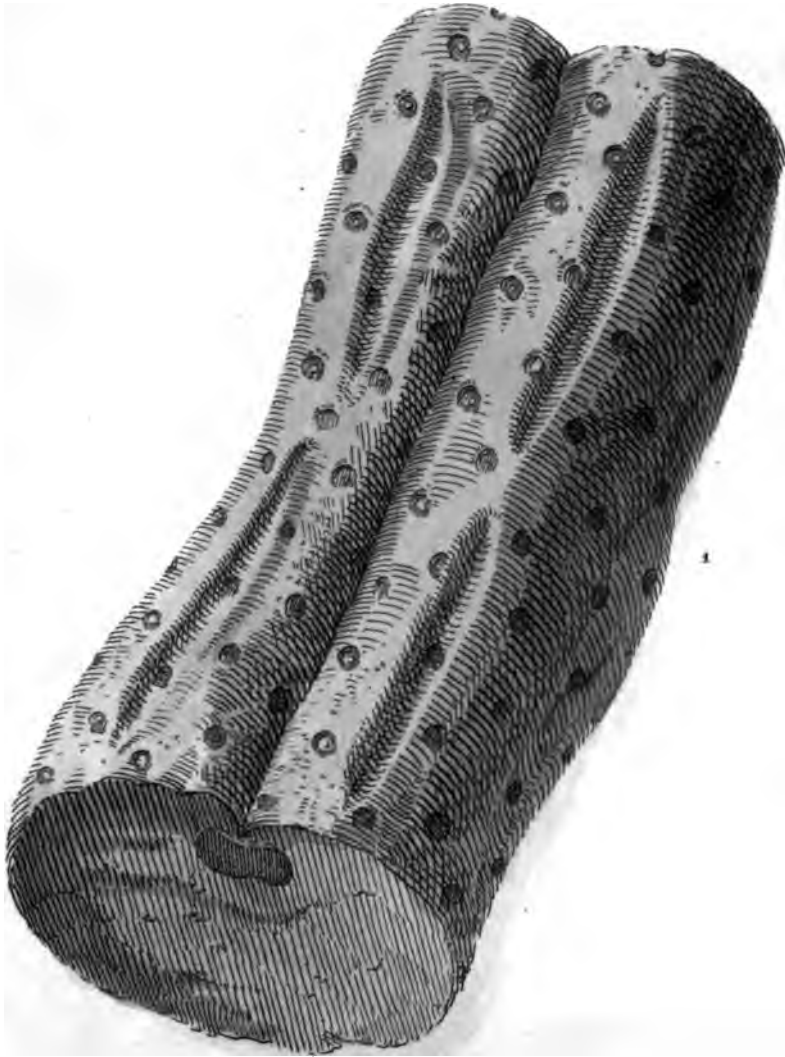


PLATE 11, 12, 13, 13*, 14.

PLANTS. GRIT AND IRONSTONE.

FIG. 1, 2, 2*.

PHYTOLITHUS PLANTITES (*verrucosus*) trunco subcylindrico subramoso; tuberculis suppressis quincuncialibus tecto, foliis confertis horizontalibus lineari-lanceolatis. S. p.

A fossil vegetable. The original a *Plant*. Trunk nearly cylindric; but somewhat flatter on one side; tubercled, leafy. The tubercles *, disposed in a quincunx order, and, generally, suppressed or sunk in small pits or hollows. Leaves † numerous, horizontal, lineari-lanceolate. On the flat side of the trunk, in most specimens, a deep longitudinal sulcus.

The internal structure of this fossil is singular. On breaking the stone, a rough, imbricated body, of a slender, cylindric form, is frequently discovered immediately under the

F

* It is proper to remark, that the tubercles vary considerably in shape and size: they are sometimes large, close, and rounded; at other times, as in specimen fig. 2, small and distant—In fig. 2* they are only marked by a small, impressed ring, in the centre of which rises a minute spine-like point.

† The leaves are very rarely distinguishable: I first traced them in some large blocks of stone, lying on the sides of the high-road near *Nether Padley*, a village between *Bakewell* and *Sheffield*. Those specimens, however, were very imperfect: some in Mr. Watson's possession at *Bakewell*, collected, I believe, near *Chesterfield*, are much more compleat; exhibiting the true form and situation of the leaves, which are inserted on every side of the stem, apparently one at each tubercle.

PLATE 11, 12, 13, 13*, 14.

sulcus. This, after a certain distance, appears to strike out laterally, and form a branch. The trunk is then continued for some length, perhaps a foot or more, without the furrow or the internal imbricated body. After which, this part is again found, and another branch put out, in an opposite direction.

This fossil is common in those parts of Derbyshire where coal and iron-stone abound: it is particularly frequent in a hard, light-coloured siliceous grit, which our miners call *Crowstone* *. The petrifications lie imbedded in the solid parts of the grit; and are generally covered with a thin black, or dark brown, ferrugineous crust; which, when broken into, is found gradually to pass into the same matter as the surrounding matrix.

The usual size of this Phytolithus is about that of the specimen represented in Plate 11. But it is sometimes found considerably larger. I have met with it near a yard in length, and twelve or thirteen inches in circumference. In all the specimens, however, I have yet procured, the extremities are imperfect; nor have I been able to ascertain in what manner they terminate in the original; though individual fossils of this kind have been traced, as I am informed, several yards through the gritstone before noticed.

The vegetable which has furnished this curious petrification is not known: it has been considered as a species of

* Probably from the number of black or dark-coloured petrifications it commonly holds. It is principally used in repairing roads.





PLATE 11, 12, 13, 13*, 14.

Cactus; but its leafy structure seems to separate it from that genus. Mr. Whitehurst mentions the fossil in his "*Inquiry into the original state and formation of the Earth*," p. 203, as the remains of the *euphorbia* of the East-Indies.

FIG. 1. The furrowed side of the trunk.

2. A specimen with the furrowed side broken off, in order to show the imbricate body which lies under the sulcus.

The figure two-thirds less than the original.

2*. Represents a specimen with the leaves remaining, in a mass of gritstone.

The specimen four or five times larger than the figure.

FIG. 3.

PHYTOLITHUS (*cancellatus*) trunci? undatim reticulato-striati: in omni interstitio squamâ parvâ subrhombicâ. S. t.

A petrified vegetable. The original a trunk or stem; surface cancellated with waving lines. In the centre of each interstice, a small and somewhat rhombic scale.

Common in argillaceous grit and coal-shale: frequent also in the coal itself, near *Burton*.

PLATE 11, 12, 13, 13*, 14.

I have never met with this species but in fragments, very much compressed; generally, indeed, only impressions of it, on the shale or gritstone. Its prototype probably a *Pinus*.

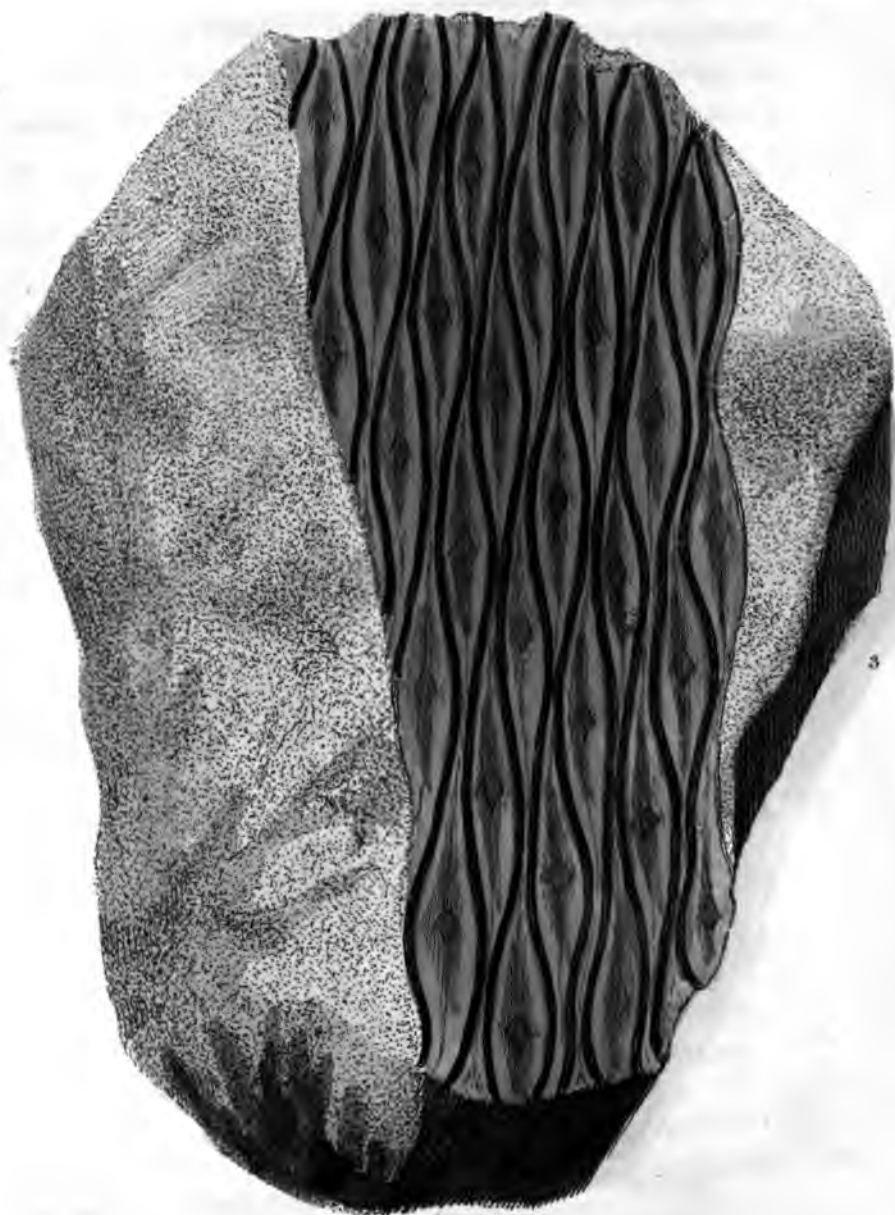
The fragment represented is in gritstone—When first gotten, the undulated lines, which lattice the impression, were covered by a soft, black film of bituminous matter, frequent on vegetable petrifications: this, contrasted with the lighter colour of the grit, gave the stone a singular and beautiful appearance. In a few days the film gradually hardened by exposure to the air, became brittle, and at length crumbled away, leaving the parts it had covered in the same state as the rest of the specimen. The drawing shows the fossil as it appeared when recently procured from the quarry. It is to be observed, that the striæ do not cross each other in this specimen: they nearly touch at the wave, and then again recede: in many other specimens I have collected, they join and present a perfectly reticulated or net-like appearance.

FIG. 4, 5.

PHYTOLITHUS PLANTITES (*imbricatus*) truncotereti squamoso: squamis rhomboideis subcarinatis imbricatis, foliis confertis subulatis. S. p.

A fossil vegetable—The original a *Plant*. Trunk round and tapering; not branched in any specimen I have yet

T. 13.



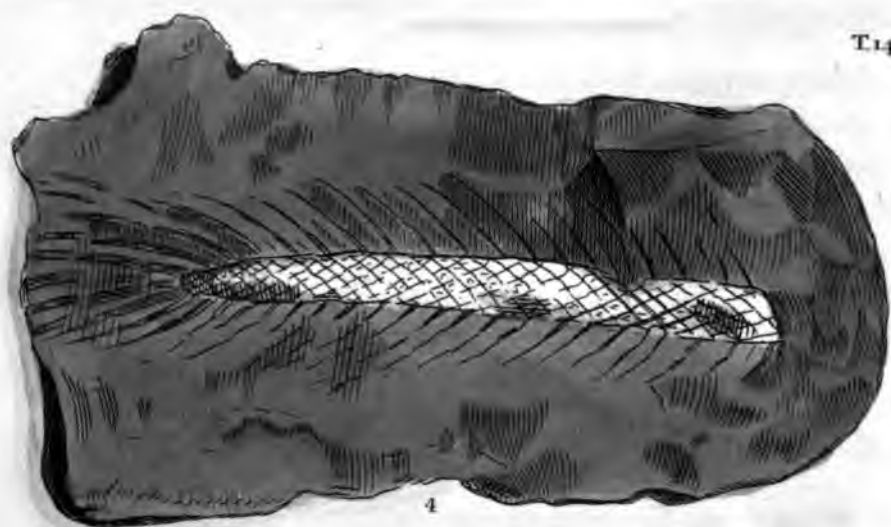


PLATE 11, 12, 13, 13*, 14.

seen; leafy, covered with scales. Leaves crowded (seemingly one from each scale) subulate, marked with a strong rib. Scales rhomboidal, sharp-pointed, slightly carinated or keeled, close, imbricate, covering each other in such a manner, that the whole surface of the stem appears regularly divided into rhombs.

Not uncommon in shale and ironstone, near *Chesterfield*. Impressions of it frequent in the coal at *Thatch-marsh*, near *Buxton*.

The original of this petrification doubtless one of the fir tribe.

FIG. 4. A specimen in ironstone. The stem compressed; covered with a white, chalky, friable, calcareous substance, common in the cavities of nodular iron ores.

5. In ironstone. The fragment *a*. appears to be the top of a specimen larger than the foregoing. It is not compressed, but rises considerably above the broken surface of the nodule—*b*. another specimen. The leaves only visible.

I have met with very perfect specimens of this fossil in gritstone, in Lancashire. One of these (Plate 50) will convey a better idea of the form and disposition of the scales than any I have collected in this county.

PLATE 15, 16.

ANOMITÆ. LIMESTONE.

FIG. 1.

CONCHYLIOLITHUS ANOMITES (*giganteus*) transversim oblongus, ad latera dilatatus, longitudinaliter sulcatus striatusque : striis scabriusculis irregularibus, valvâ alterâ gibbosâ. S. t.

A petrified shell—The original an *Anomia*, imperforate, transversely oblong, dilated at the sides. Hinge straight, extending the whole breadth of the shell. One valve flat or concave; the other very gibbous, longitudinally furrowed and striated. The striæ are irregular, frequently confluent, and rough with small tubercles, which in some specimens take the form of short, blunt, appressed spines. The furrows are deep, and distant from each other. The beak of the larger valve is blunt and rounded; sometimes curved considerably over the hinge.

Common in the limestone about *Burton*.

This is a very large shell: I have seen it near a foot in breadth, and eight or nine inches from the beak to the opposite extremity: its more usual size is that of the figure.

Specimens of this fossil very rarely occur in which the smaller valve is visible. When it can be traced, it appears

T. 15



X

Fig.



PLATE 15, 16.

flat or concave; but it is generally so imbedded in the mass of stone usually constituting that side of the specimen, that its true form can scarcely be ascertained; it sometimes indeed seems to be wanting. The surface of the large valve is most commonly shattered and imperfect.

FIG. 1. Represents a specimen with the striæ and furrows more regular than they usually are found.

FIG. 2.

CONCHYLIO LITHUS ANOMITES (*crassus*) subrotundus, longitudinaliter sulcatus striatusque: striis tuberculatis, valvâ alterâ subglobosâ. S. p.

Differs from the foregoing in the sides not being dilated; and in the beak, which is broader, more convex, and rarely curved so much over the hinge. The tubercles are generally also less spine-like, smaller, and the striæ more regular than in *C. a. giganteus*.

A large species; but seldom attaining the size of the former. It is common in most parts of Derbyshire, where limestone strata prevail. I have met with some good specimens between *Burton* and *Fairfield*, on the top of the hill called *Stonebench*. The larger valve is all that is commonly found of this fossil.

PLATE 17, 18.

CORAL. LIMESTONE, QUARTZ, AND CHERT.

FIG. 1.

ERISMOLITHUS (*Madrepora cespitosa*) Madreporæ fasciculatæ stirpibus cauliformibus teretibus subramosis striatis flexuosis hinc coalescentibus, stellis terminalibus turbinato-concavis reticulatis. S. p.

Fossil coral. The original a *Madrepora*, compound, fasciculate. Stirps cauliform or stalk-like, round, somewhat branched, striated slightly in a longitudinal direction, flexuose, and, in some parts, coalescent. The stars are terminal, turbinato-concave, and reticulated.

Not uncommon about *Bakewell*, *Winster*, *Castleton*, and other places where the limestone strata occur. Frequently chert with the matrix limestone.

The best specimens of this, as well as of the other fossil corals, are found in the loose stone walls, with which the lands in many parts of Derbyshire are fenced. In such, or similar situations, where the limestone has been broken into small pieces, and exposed for a length of time to the action of the weather, the surface is generally found to be more or less decomposed and washed away; while the chert or quartz which constitutes the petrifications, if the stone con-



T.18

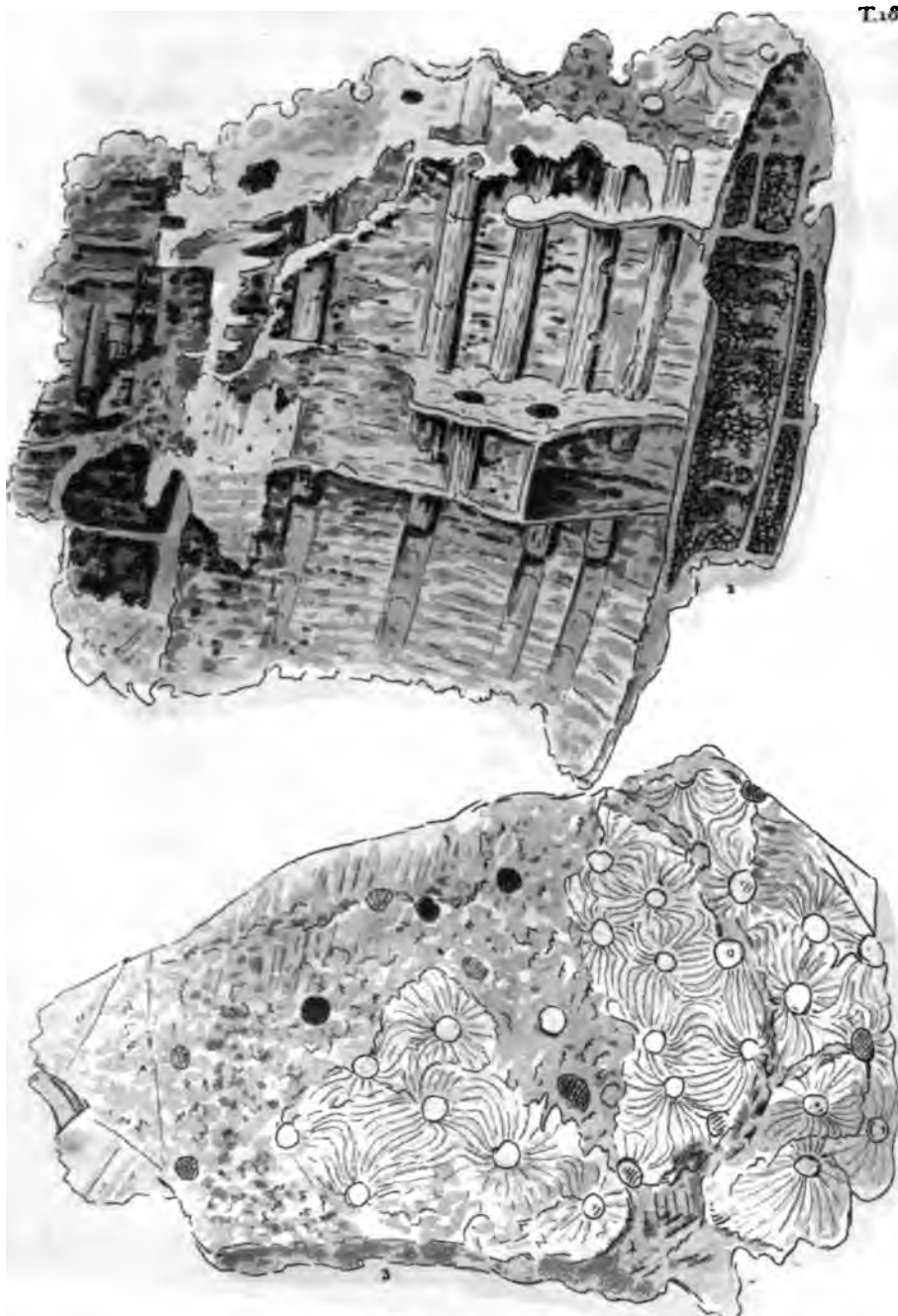


PLATE 17, 18.

tain any, is either wholly detached, or left adhering to such parts of the matrix, as have escaped the effects of the air and rain. I have met with some very perfect specimens of this kind, in a wall between *Sheldon* and *Ashford*, on the right hand side of the road, about half a mile from the first mentioned village.

This petrification is usually considered as the remains of the *Madrepora caspitosa* of Linnè. Two varieties of it are found in this county: in one the branches are somewhat clavated, growing thicker toward the tops: the other has the branches perfectly cylindric and equal.

FIG. 1. Is a specimen of the first variety, in a large mass of limestone: the coral itself consists of quartz and chert. A drawing of the other variety will be given in the course of the work.

FIG. 2, 3.

ERISMOLITHUS TUBIPORITES? (*radiatus*) aggregatus, dissepimentis transversis undatim radiato-striatis tubos erectos striatos connectentibus. S. p.

Fossil coral. The original a *Tubipore*? Aggregate. Stirps tube-like, distant, erect, striated, parallel, and connected by transverse dissepiments or partitions. The surface of

PLATE 17, 18.

the dissepiments radiated with numerous, undulated striæ. Each tube, where it passes through the dissepiment, forms the centre to a star of these striæ, which are extended, until they meet and unite with the radiations from the surrounding tubes.

Rare : the specimen figured, from *Winsten*.

I have classed this coral with the *Tubiporæ*, but am doubtful if I am right in so doing. In its external form, the fossil very much resembles some of the recent *Madrepores*, particularly the *Madrepora musicalis*, to which indeed it seems nearly allied, though unquestionably a distinct species. I have never been able, however, to trace in the tubes the least appearance of the stellated lammellæ, which characterize the *Madreporæ* : and should the species hereafter be found to possess such a structure, it will still be distinguishable from others in that genus, by the radiations of the dissepiments.

FIG. 2. Exhibits a specimen of this petrification.

3. The same in a different position ; showing the upper dissepiment. This specimen consists of chert and quartz. Its surface is somewhat *drusy*, or set with minute quartz crystals, scarcely to be expressed by a drawing. Between the tubes, lie a number of irregular, porous bodies, about the size of a nut, or smaller, perfectly detached from the

PLATE 17, 18.

surrounding stone, and calcareous ; possessing all the nature of the original, of which they evidently formed a part. These bodies, when minutely examined, are found to have the same radiated structure as the dissepiments, which in many parts of the fossil appear to have surrounded the tubes in a solid form, instead of being divided by intervals into plates or laminæ. A similar structure sometimes takes place in the *Madrepora musicalis*.

It is necessary also to remark in the present specimen an *appearance* of perpendicular dissepiments. These, however, though connected with the transverse ones, do not seem to have constituted any part of the original coral : but, apparently, have been formed since its mutation, by a gradual deposition of siliceous matter, between the tubes.

PLATE 19, 20.

FERN AND OTHER VEGETABLE REMAINS. IRONSTONE.

FIG. 1, 2, 3.

PHYTOLITHUS (*Osmunda regalis*) Filicis fronde bipinnatâ: pinnis ovato-lanceolatis alternis patentibus: pinnulis ovalibus integerrimis. S. p.

A fossil vegetable. Original a *Fern*. Frond bipinnate. The pinnæ ovato-lanceolate, alternate, numerous and spreading. The pinnules alternate, oval, and very entire, (the terminal one generally larger and ovate) with crowded, dichotomous nerves, running from the midrib to the margin.

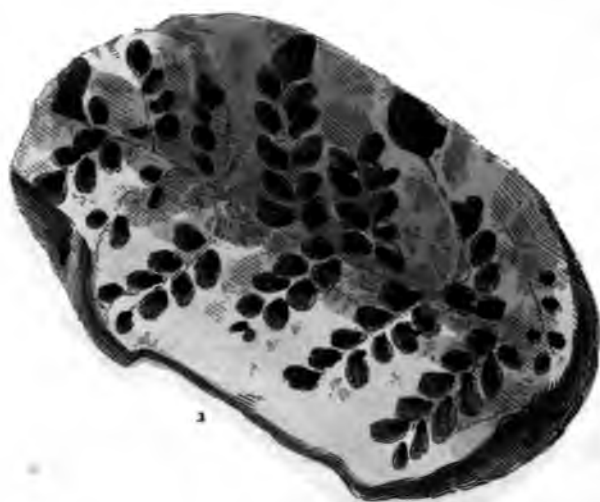
Frequent near Chesham, Ayrton, &c. in sand and ironstone.

This has been described by most writers on extraneous fossils: and by all, I believe, has been considered as a petrification of the *Osmunda regalis*. As such I have named it; though I confess myself doubtful, if the prototype be really the species in question.

FIG. 1. Half of a nodule of ironstone, holding a specimen of this fossil.

2. A smaller nodule containing one of the pinnæ.

3. Another nodule with part of a pinnæ.



T. 20.



4



5



6

PLATE 19, 20.

The above specimens exhibit the upper surface of the frond. The nodules sometimes break, so as to show the under surface. In this case the petrification itself is concave, its impression, in the other half of the nodule, convex; contrary to what is generally observable in fossil leaves.

FIG. 4, 5, 6.

PHYTOLITHUS PLANTITES (*stellatus*) caule simpliciter striato, foliis linearibus verticillatis. S. p.

A fossil vegetable. Original a *Plant*. Stem simple, round, slightly striated in a longitudinal direction. Leaves whorled, linear, entire, about twelve or fourteen in each whorl. The whorls numerous, but distant.

Found now and then in ironstone, coal, bind, &c. with other vegetable remains.

The prototype of this petrification is generally supposed to be an *Equisetum* or *Horsetail*; but there are other plants with stellate leaves, to which it might with as much propriety be referred; *Hippuris*, *Asperula* and *Galium* for instance.

We may here observe, that little has yet been done with respect to discriminating the original genera of fossil plants: those parts, indeed, on which such discrimination *must* be founded, are rarely, if ever, visible in the petrified state.

PLATE 19, 20.

The characteristic distinctions of the species are frequently attainable, if studiously sought after, by a diligent and careful comparison of various specimens; and the habit or general appearance of the fossil often leads to the knowledge of the natural class and order of the recent plant: but its genus, for the most part, remains undetermined, or doubtful.

FIG. 4. Part of a nodule of ironstone, broken (in regard to its contents) in a transverse direction, showing three whorls of leaves belonging to the above described petrification. Similar remains have been called *petrified flowers* by collectors of fossils. These differ, however, from the next specimen, only in size, in being found three or four together in the same nodule, and in the direction in which they lie in the stone.

5. A nodule holding a single plant in a different direction.

6. I am not certain if the remains in this nodule are the same as those above. The stem is much thicker, and the whorls more distant, in proportion to the size of the plant, than in most other specimens I have examined. There is also some appearance of branches in one part of the stem; but I have not, as yet, met with any specimens that would enable me to determine a specific distinction.

PLATE 21.

A PETRIFIED NUT. GRIT AND IRONSTONE.

FIG. 1, 2, 3, 4, 5, 6.

PHYTOLITHUS (*nuceus*) Fructûs * *nuce ovatâ*
acuminatâ trigonâ. S. t.

A fossil vegetable. The original a *Fruit*, containing a nut. The nut ovate, with the base rounded and marked with a small flat circle; the apex acuminate, ending in a sharp, angular point; and the sides furnished with three prominent longitudinal angles; acute, equidistant, and terminating in the point just mentioned. The form and nature of the integuments, which enclosed the nut, uncertain—rarely occurring in the fossil.

Not very common in Derbyshire†: it is now and then found in the grit and ironstone; but, I believe, in no great

* *Drupæ*?

† More frequent in Lancashire: I collected, some years back, in a stone quarry near Wigan, a considerable number of specimens, in no respect differing from those found in this county. The men, who worked in the quarry, informed me, that at times these nuts were rare to be met with; but when a few were found, they seldom failed in discovering more—frequently a hundred or two, in three or four feet of stone, if they took the trouble of breaking it for that purpose. I sent a number of these specimens to botanical friends, requesting their opinion, as to the plant which might be supposed to have produced this curious petrification; but have never gained any satisfactory information on the subject. Were I to hazard a conjecture myself,

PLATE 21.

quantity. It lies in the solid parts of the stone; generally covered by a black, bituminous matter, which, it is evident retains the perfect form of the shell of the nut, and has served as a mould for the interior part of the fossil. When broken into, it is found to be solid; exhibiting no other appearance than that of the surrounding stone.

FIG. 1. A side view of a specimen detached from the gritstone, in which it was found.

2. The larger end of the same specimen.

3. A piece of gritstone; one side broken away, so as to show the nut which lies in the centre. These figures are about the size of the original. I have now and then, however, met with much larger specimens.

4. A smaller specimen, adhering to a piece of fine, light-coloured grit.

5. A nodule of ironstone containing another specimen of the same fossil. In this there are evident traces of the rind or covering, which once surrounded the nut: it seems to have been of a considerable thickness, and, as far as can be

it would be, that the original is a species of *Cocos* or *Areca*, notwithstanding the diminutive size of the fruit—In the quarry above mentioned, however, no other vestige of the plant was discovered, that could lead to the knowledge of its genus.

T. 21.

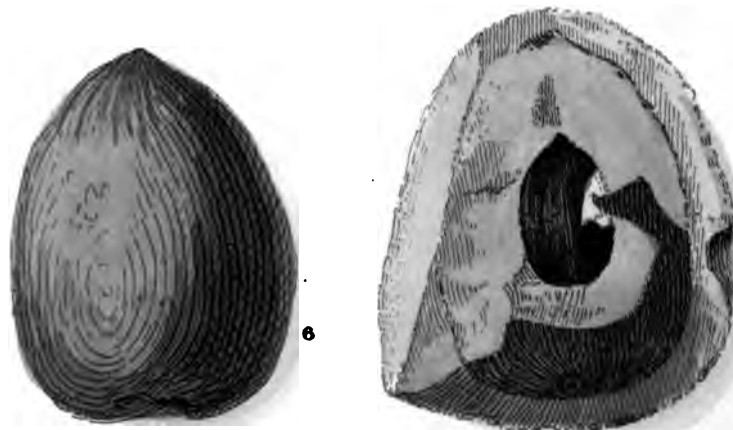
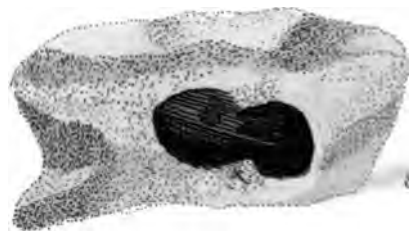


PLATE 21.

judged by the parts which are visible, somewhat of the shape of the nut itself: but, probably, of a much more perishable nature; otherwise, we may reasonably suppose, it would more frequently occur in the fossil state.

6. As the shape of the exterior covering will scarcely be ascertained from the foregoing drawing, by those who do not see the original specimen, I have added this figure; which, I think, would be nearly the form and size of the husk, if detached from the surrounding ironstone.

K

PLATE 22, 23.

ANOMITE: LIMESTONE.

P. 22.—FIG. 1, 2, 3.

CONCHYLIO LITHUS ANOMITES (*productus*) valvâ
alterâ longitudinaliter striatâ, gibbosâ productâ sub-
cylindricâ alteram amplexante. S. p.

A fossil shell. Original an *Anomia*. Imperforate. Hinge straight, extended. The larger valve gibbous, lengthened out in a cylindric form, and longitudinally striated; the striæ close, equal, and towards the margin dichotomous; the margin itself somewhat sinuous and irregular. In many specimens the upper part, particularly near the beak and hinge, set with a few, distant tubercles; the beak small and pointed. The other valve is very small, semicircular, and concave, clasped or surrounded by the larger valve. It is longitudinally, and, sometimes, transversely striated.

This curious *Anomite* is found in many parts of the county. Some of the largest and best specimens I have seen, I collected in a mine near *Croom*, about four miles south of *Burton*.

Its most striking characteristic is the lengthened cylindric form of the convex valve—This is always filled with limestone, which entirely conceals from observation the

PLATE 22, 23.

other part of the shell, as long as the specimen remains whole. With the slightest blow from a hammer, however, it constantly divides, *where the edge of the smaller valve rests against the inside of the elongated, cylindric part of the larger valve*; generally about half an inch, or less, from the top of the shell; (see fig. 1. *b.*) one side of the valve before hidden, then becomes visible; sometimes in the smaller, but more generally in the larger division of the specimen, as delineated in fig. 2.

FIG. 1. The most perfect form in which this petrification occurs. *a. a. a.* a rude mass of limestone filling the inner part of the shell. *b.* marks the line where the specimen divides. It is proper to observe, that no external appearance of any commissure is discoverable, previous to the breaking of the specimen.

2. The same in a different position, the top broken off.

3. Inside of the top, as separated from fig. 2.

Amongst fifty specimens, or more, of this fossil, which I have examined, I have never met with one that did not break as described; or when broken, did not exhibit the appearances delineated in the foregoing figures. The outside of the specimens generally consists of a white, friable, spar.

PLATE 22, 23.

FIG. 4, 5.

CONCHYLIOLITHUS ANOMITES (*Pugnus*) subrotundus, longitudinaliter sulcatus: sulcis obsolescentibus, valvâ imperforatâ gibbosâ, margine undato: undâ 5-plicatâ. S. p.

A fossil shell. The original an *Anomia*. Perforate; the foramen or perforation very minute, (rarely visible) situate in the under part of the beak of the larger valve. Hinge curved, narrow (*i. e.* not patulous as in some of the square hinged *Anomiæ*). Both valves convex, roundish, sulcated longitudinally; the furrows gradually becoming obsolete as they approach the beak. The imperforated valve gibbous near the margin; the gibbosity divided by the above mentioned furrows into five, rounded, prominent ribs. The larger valve hollowed into a single wave on the back, which terminates in a very large, deep, and somewhat square wave at the margin. The wave of the margin five-plaited. The beak is small, pointed, and incumbent.

Common with the other *Anomia*, in limestone.

FIG. 4, 5. Show the same specimen in different positions.

T.22



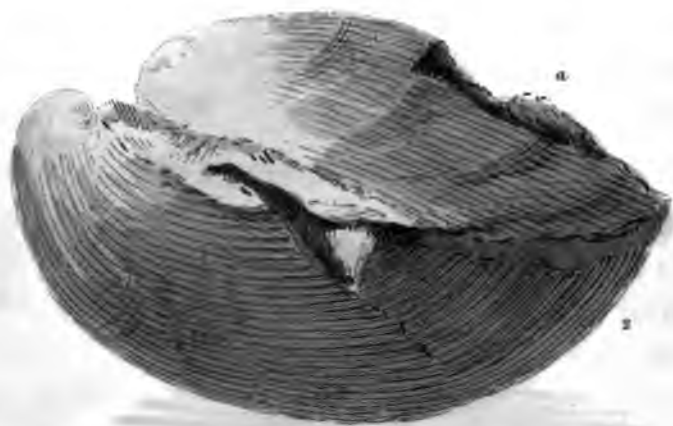


PLATE 22, 23.

P. 23.—FIG. 1, 2.

CONCHYLIO LITHUS ANOMITES (*striatus*) semiorbiculatis obsoletè undatus longitudinaliter undique striatus: striis approximatis elevatis subæqualibus.
S. p.

A fossil shell. The original an *Anomia*. Perforate; the perforation large, triangular, between the beaks. Hinge straight, extended, patulous. Valves convex, semicircular, and longitudinally striated on every side. The striæ close, nearly equal, and prominent. In the smaller valve, a convex wave, which is answered by a concave one (scarcely distinguishable) in the larger valve; both terminating in a small wave at the margin. The beak of the perforated valve, large, curved, and somewhat pointed.

Not uncommon about *Castleton*, and other parts of Derbyshire, where the limestone strata occur.

FIG. 1. 2. Two different views of the same specimen—The outside consists of grey limestone, which has displaced the original shell—The inside is filled with spar—visible at *a. a.* where the limestone is broken.

In this specimen, the aperture, which divides the hinge between the beaks, is hidden by a small portion of the matrix (a hard limestone) remaining in that part. Since our drawing was made, we have met with more perfect specimens, in which the perforation is sufficiently evident.

PLATE 24.

ENTROCHITÆ. LIMESTONE AND SPAR.

FIG. 1, 2.

The common *Entrochites*—(See plate 2, fig. 1, 2, &c.)

FIG. 1. We have observed in a preceding part of this work, that the fossil *Entrochi* vary considerably in shape. The specimen now figured, differs so much in external appearance from that which is given in Plate 2, fig. 1, that a casual observer would scarcely consider them as the same species. They are both, however, even, cylindrical, and jointed; perforated through the centre, and furnished with lateral arms or branches. The principal difference consists in the joints being smaller, and the branches (in proportion to the size of the stem) considerably thicker in the present fossil, than in that before delineated. But we conclude the recent animals not to have been distinct, as the petrification is found in every intermediate size and form between the two varieties here noticed.

- a. a. a. Cavities from which lateral branches proceeded.
- b. b. b. Fragments of the branches remaining in the stem.

2. The first joint of one of the branches, or that part which is immediately inserted into the stem—On one side convex, correspondent to the cavities a. a. a. fig. 1—marked

T.24.



PLATE 24.

with a few concentric circles, and crossed by parallel, transverse lines, answering the number * of joints, into which the end of the branch was indented.

Frequently found detached, among other petrifications.

FIG. 3.

A group of *Entrochita* of different species, in limestone.

* This varies considerably in different specimens—In fig. 1, of the present plate, each of the cavities occupies a space equal to the length of nine or ten joints—In fig. 1, plate 2, the diameter of the cavities does not exceed the length of one joint.

PLATE 25, 26.

VEGETABLE REMAINS. GRIT AND IRONSTONE.

FIG. 1, 2.

PHYTOLITHUS (*arundineus*) GRAMINIS? trunci
simplicis recti teretis: articulis longitudinaliter stri-
atis: striis æqualibus confertis. S. t.

A fossil vegetable. The original the trunk or *culm* of a Grass? Simple, straight, round, jointed; the joints numerous, short, and longitudinally striated—the *striæ* close and equal.

Found with other vegetable remains, in the argillaceous strata, near *Alfreton, Chesterfield, &c.*

This fossil differs from the *Phytolithus* figured at plates 8, 9, in having the joints marked with superficial close lines, instead of deep and distant furrows—Both species are found to vary considerably in thickness—from that of a reed, to four or five inches in diameter: but the character of each appears constant, throughout this variety of size. We think ourselves justified, therefore, in considering them as distinct; at least till accurate observation shall have proved the contrary.

FIG. 1. A specimen in gritstone, somewhat compressed.
a. part of the stone remaining in which it was found.

2. Another specimen, twelve inches long.—Gritstone—
The surface black, from a bituminous matter adhering to

+

Fig.



T. 36.

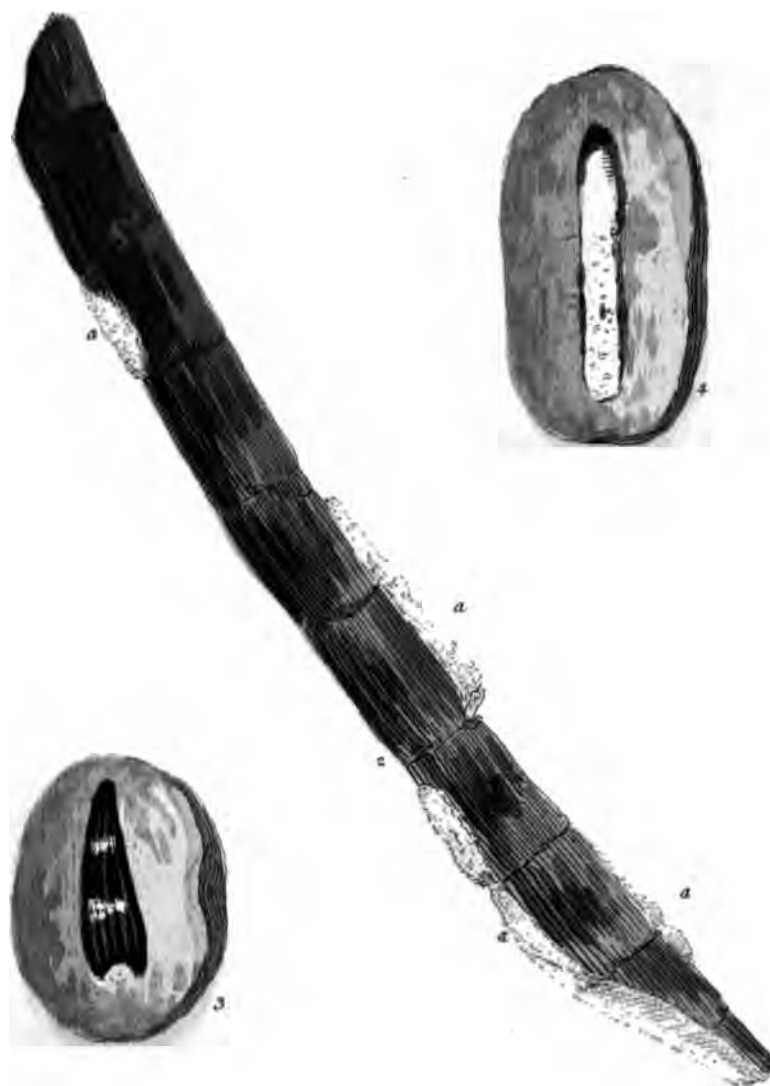


PLATE 25, 26.

it: *a. a. a. a.* parts of the stone remaining, which formed the matrix—A fine, light-coloured grit, above the coal.

I have met with single joints of this fossil in ironstone: one in particular of a large size, measuring above twelve inches in circumference.

FIG. 3.

Represents half of a nodule of ironstone, containing the seed-vessel of an unknown plant.

Since this drawing was made, I have been favoured, through the means of a friend, with a much larger, and, in many respects, more interesting fossil of the same kind; a figure and description of which will be found in another part of the work—It is unnecessary to add more, in this place, respecting the present specimen.

FIG. 4.

Is not given as a petrification, though generally mistaken for one, by the collectors of fossils in Derbyshire—It is part of a nodule of ironstone, having a long, cylindric cavity in the centre, partially filled with a loose, white, calcareous earth.

There is little doubt of all nodulous ironstones having been in a soft or yielding state—In hardening, cavities

PLATE 25, 26.

would be formed, varying in figure and size, according to the degree of contraction the substance of the stone might be capable of; which would, in some measure, depend on the proportion of its component parts, as well as the state and pressure of the surrounding *stratum*. These cavities would remain empty, or be gradually filled, by infiltration, with whatever substance the water, afterwards pervading such *stratum*, contained. The matter thus introduced was generally calcareous earth, which we find, lodged in the fissures of the ironstone, in the form of spar, or as a soft and loose powder.—Such appears to have been the origin of the *Ludus Helmontii**, and some other varieties of structure observable in nodulous iron-ores; and it is highly probable, that the cavity in the present nodule was produced in a similar manner—At least, it is certain, that it does not owe its form to any organic body; notwithstanding, fossils of the same kind are preserved in many collections under the fanciful titles of *petrified worms* and *caterpillars*.

* Or, as it is now usually called, the *Septarium*—Beautiful specimens of this stone are frequently met with in Derbyshire—In some the divisions consist of a close, white spar, which, when the specimen is polished, has an elegant and singular appearance, contrasted with the black, or dark brown colour of the ironstone. In others, cavities occur only partially filled with crystallized spar, bitumen, and ochre blended together. Some very large stones of this kind may be observed, when the water is low, in the bed of the small stream, which runs at the back of the grove, belonging to the Old Hall at *Buxton*—They lie in the *stratum* of shale immediately preceding the limestone—Many of them measure two or three yards in diameter.

PLATE 27, 28.

SHELLS. IRONSTONE.

P. 27.—FIG. 1, 2.

P. 28.—FIG. 5.

CONCHYLIO LITHUS (*Myæ ovalis* *) MYÆ testâ
ovatâ, natibus rugosis, (cardinis dente primario cre-
nulato: laterali longitudinali: alterius duplicato.)
S. p.

A fossil shell—The original a *Mya*—Ovate, marked with unequal, concentric, transverse, *striae*. One end somewhat pointed, the other rounder. Beaks wrinkled, placed near the obtuse end. Hinge (visible only in the recent species) furnished, in one valve, with a broad, thick, crenated tooth, from the side of which proceeds a single, smooth longitudinal one—In the other valve the teeth are double, otherwise similar in form.

Found in a solid stratum of ironstone, which extends from *Tupton-Moor* to *Stavelly*. Mr. Whitehurst considers this petrification, in his "*Inquiry into the original State and Formation of the Earth*," p. 208, to be the remains of the

* The original of this fossil has been confounded by English authors, with the *Mya Pictorum* of Linnè, to which it is nearly related, though certainly a distinct species. It is very common in most of our rivers; whereas the true *Mya Pictorum* is rare, if indeed it has been ever found, in this country. Dr. Pultney appears to be the first English naturalist who noted the difference between these two shells. In a part of this work formerly published, we had fallen into the same error as others, in supposing the prototype of our petrification to be the *Mya Pictorum*. The mistake was obligingly pointed out by Mr. Sowerby, to whom we beg leave to return our thanks.

PLATE 27, 28.

fresh water *horse muscle*. His supposition respecting the recent shell was correct, if by the *horse muscle* he meant the *Mya ovalis*, a common species in our rivers, and most undoubtedly the original of the present fossil. The shells, however, generally called *horse muscles* (*Mytilus cygneus*. & *Myt. anatinus*) which are still more common than the *Mya ovalis*, and frequently found with it in the recent state, I have not, as yet, observed in any of the ironstones of Derbyshire. It is probable, they may occasionally occur, with other fresh water shells*; but the principal mass of organic remains, forming the white figures in the stone when broken, (see fig. 5) and of which, indeed, the *stratum* almost wholly consists, will be found, on a careful comparison of the fossil with the recent species, to have originated from the *Mya* in question.

FIG. 1. A specimen of one of the shells in the most perfect form they are ever procured, from the surrounding stone.

2. The same, in a different position—showing the beaks and back of the hinge. This specimen is wholly ironstone :

* I have been informed, that a species of *Ammonites* has been found in the solid stratum of ironstone, as well as in nodules, near *Wingerworth*. I have not seen the specimens; but, as the *Ammonitæ*, and every kind of fossil *Nautili* yet known, are certainly marine productions, it is probable, the shells taken for such, will prove to be the remains of the *Helix cornea*, or of some other species of the depressed univalves, which inhabit our still rivers and pools; for it rarely happens, that the productions of the sea are mixed, in the fossil state, with those of the land, or fresh water.



T. 28.



PLATE 27, 28.

in general, the specimens are spar, filled with ironstone. The outside is covered with a thin, black substance, which appears to have been the *epidermis*, or outer covering in the recent shell.

P. 28—FIG. 5. A piece of the solid *stratum*—The shells, spar. This stone is of a deep, rich brown, when recent from the quarry, as represented—exposed to the air the surface becomes yellow—It takes a beautiful polish—The *stratum* is about a foot thick, and lies, as I am informed, eight or nine yards below the surface.

P. 27—FIG. 3.

A mutilated specimen of a bivalve shell found in ironstone. Spar, the outside coloured with ochre. This fossil differs from the shells, which are most common in the stone; but its imperfect state prevents the species from being determined.

P. 27—FIG. 4.

Represents a specimen of a very remarkable kind of calcareous ironstone, found immediately above, and attached to, the solid *stratum* containing the shells. It consists of a mass of stone, which breaks into perpendicular, conical bodies, similar to the figure. These are made up of smaller, concentric cones; in their perpendicular and diagonal frac-

PLATE 27, 28.

tures, exhibiting a fibrous, ramified texture, not unlike that of some of the *Hæmatites iron-ores*—Each fracture is also marked with regular, elevated, parallel, transverse, lines, generally of a darker colour than the rest of the stone.

This fossil, from the organic appearance of its structure, has been mistaken for a petrification.—That it is not one, will be evident, if we maturely consider its form and composition.—The internal structure of organized bodies, animal or vegetable, always differs essentially from the external figure. But, in the fossil now under consideration, the minutest particle, when examined by a glass, exhibits, in miniature, the same ramified, conical, and transversely striated appearance, that pervades the whole mass, or any of the parts it may be broken into. We, therefore, conclude, the origin of this stone to be no more organic, than that of *Fibrous Gypsum*, *Spars*, and other regularly formed, native fossils.

This ironstone, when first got, is of a deep brown colour, in a few days the surface changes to a bluish grey, tinged with yellow—It effervesces with acids; grows black in the fire, and is then attracted by the magnet—It probably contains *Manganese*.



PLATE 29.

A MASS OF ANOMITÆ. LIMESTONE.

The limestone, in some parts of Derbyshire, appears to have been formed wholly of shells. Beds of them may frequently be traced of several miles in extent.—The *stratum*, from which the mass, figured in the adjoining plate, was broken, consists almost entirely of one species of *Anomite*, (see fig. 1, plate 36) with scarcely a fragment of any other shell—The whole is a hard, grey, scaly limestone, similar to that in which the *Entrochi* are commonly imbedded.

PLATE 30, 31.

CORAL. CHERT AND LIMESTONE.

FIG. 1, 2.

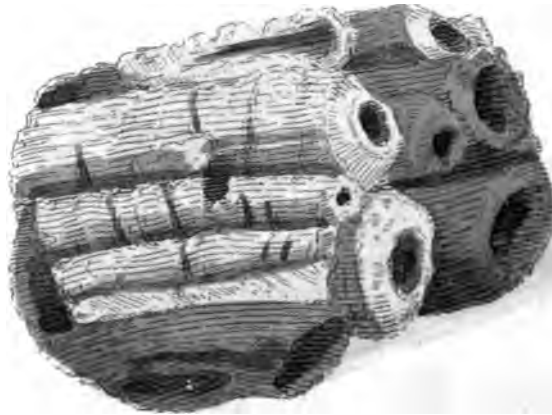
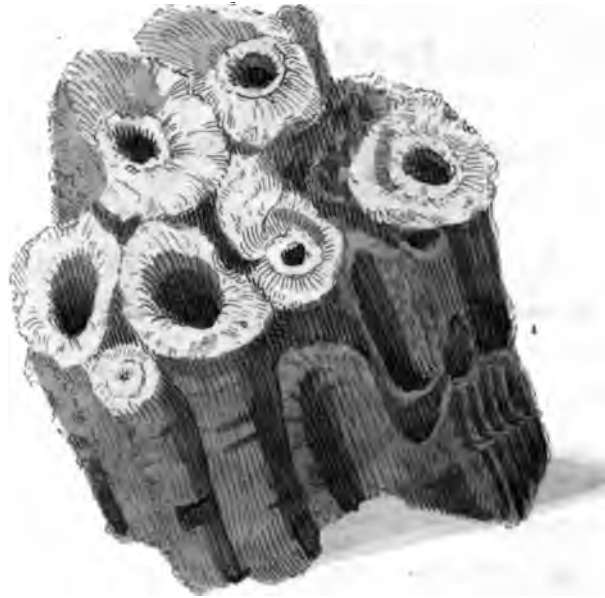
ERISMATOLITHUS MADREPORITES (*duplicatus*)
aggregatus, stirpulis scapiformibus cylindricis striatis
coadunatis, stellis margine dilatatis: centro subpro-
lifero. S. p.

Fossil coral. The original a *Madrepore*. Aggregate; the mass irregular, consisting of numerous scapiform stirplets, cylindric, longitudinally striated, coadunate and unequal, varying in size, from that of a small quill, to half an inch or more in diameter. The cavity of each stirplet reticulated, terminating in a radiated aperture, or star; the margin dilated; the centre proliferous, bearing a smaller spreading, central, prominent star, which appears to be the commencement of a fresh stirplet, or a further elongation of the old one:

Not uncommon in limestone; but rarely found in a perfect state. The specimen figured, from *Bakewell*.

FIG. 1. Shows the terminal spreading apertures. The lamellar stellated structure of the cavities is not well preserved in this specimen: in other respects it is very perfect. The duplicated form of the star is more evident and entire than in most other specimens which I have seen.

T. 30.



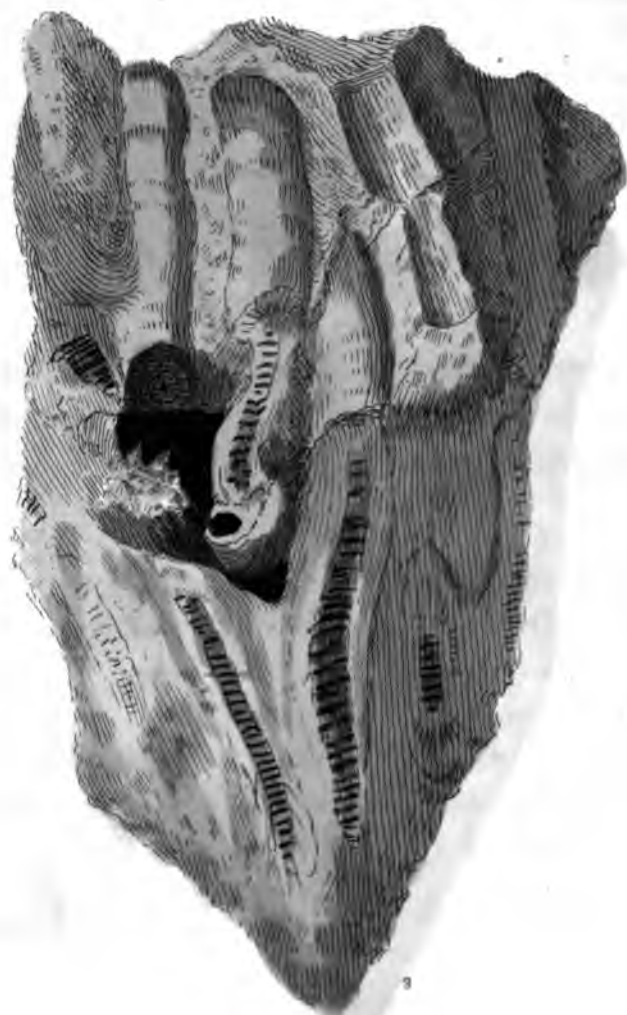


PLATE 30, 31.

2. The same in a different position, showing the opposite extremity. Chert.

There is another coral in Derbyshire, which resembles the present one in every respect, except in its apertures. These are concave, and reticulated, but simple and destitute of any spreading margin. At present I consider these fossils as distinct: they may perhaps, however, prove to be only varieties of the same species.

FIG. 3.

ERISMATOLITHUS MADREPORITES (*affinis*) consociatus, stirpulis cauliformibus subramosis lævibus subflexuosis, stellis terminalibus concavis reticulatis.
S. p.

Differs from *E. Madrepora cespitosæ* (t. 17.) in the stirps being proportionably thicker, smooth, without striæ, and less matted, or more distinct from each other. To this we may add, the form of the branches, which are always cylindric and equal, and not so flexuose as those of *E. M. cespitosæ*, of which, however, it perhaps ought to be considered only a variety.

Not very common. It is found near *Winster*, and some other places.

PLATE 30, 31.

FIG. 3. Exhibits this fossil in a mass of limestone.

We have met with more perfect specimens than that now represented; but have chosen it for our drawing, on account of its holding, in a small cavity, a beautiful group of pyramidal quartz crystals, which, as not being very common in our Derbyshire limestones, we thought in some degree worthy of notice. The specimen also contains an *Anomia* between the branches of one of the stems—A situation the shell probably occupied, when both it and the coral were in a recent state*.

The lower part of the specimen is broken, and shows the internal structure of the stirps.

* “The living *Anomia* have all been found lurking in the nooks between the branchings of corals, or cavities of rocks.” Da Costa’s *Elements of Conch.* p. 258.

PLATE 32, 33.

ANOMITE. LIMESTONE.

FIG. 1, 2, 3, 4.

CONCHYLIO LITHUS ANOMITES (*semireticulatus*)
semiorbiculatus, valvâ planâ decussatâ striatâ, alterâ
gibbosâ longitudinaliter striatâ, natem versus trans-
versim rugosâ. S. p.

A petrified shell. The original an *Anomia*. Imperforate, with one valve concave, the other convex, the hinge straight and extended. The general form, or outline of the shell semiorbicular. The concave valve reticulated, with prominent and somewhat uneven striæ. The convex valve gibbous, generally marked on the back by a slight concave wave, and longitudinally striated; the striæ rude, strong, and unequal; near the beak, transversely wrinkled, which gives the valve a semireticulate appearance: towards the margin, the striæ are destitute of wrinkles; but, for the most part, are dichotomous or forked. The beak is small and pointed, and rarely curves much over the hinge. A variety of this shell occurs with the sides extended, as in *C. A. giganteus*. (Tab. 15.)

Common in most parts of Derbyshire where limestone is found.

PLATE 32, 33.

FIG. 1, 2. Show the same specimen in different positions.

3. A smaller specimen.

4. An impression, on limestone, of the concave valve.

Impressions of the concave, or flat valves, of the imperforate *Anomites*, are often found detached from the petrifactions themselves; and, as they exhibit a convex surface, are liable, without some attention, to be mistaken for distinct species.

FIG. 5, 6, 7, 8.

CONCHYLIO LITHUS ANOMITES (*acuminatus*) cordiformis lævis, sinu margine longissimo cuneato.
S. p.

A petrified shell. The original an *Anomia*. Perforate; both valves convex, cordiform or heart-shaped, and smooth; the surface being destitute of striæ*, furrows, or tubercles. The hinge curved, and close. Foramen very minute; under the apex of the beak, which is small, sharp-pointed, and incumbent. The larger, or beaked valve, hollowed at the back into a single wave, ending in a very long, sharp-

* The larger specimens, under a glass, appear to be marked with very minute, close, and equal striæ.



1



7



3



8



2



PLATE 32, 33.

pointed, cunieforn or wedge-shaped sinus, at the margin.

This very curious Anomite is not uncommon near *Bakewell* and *Burton*, in the limestone strata. It varies considerably in size.

FIG. 5. Is a large specimen in dark grey limestone, the surface covered in part by a white sparry substance, which has, seemingly, taken the perfect thickness and form of the original shell.

6. The same, placed so as to show the sinus at the margin.

7 and 8 are a smaller specimen.. Spar.

PLATE 34.

VEGETABLE REMAINS. IRONSTONE.

FIG. 1, 2.

PHYTOLITHUS FILICITES? (*auriformis*) fronde
simplice auriformi subundulatâ: nervis dichotomis
subobsoletis a basi ad marginem extensis. S. p.

A fossil vegetable. The original a *Fern*? Frond simple, ear-shaped; the surface somewhat undulated; marked with dichotomous, indistinct nerves, extending from the base to the margin.

This fossil is not common: it occurs in the ironstone on the borders of the county, near *Alfreton*: it has been found also near *Chesterfield*; elsewhere I have not observed it.

FIG. 1. Represents a very large specimen in ironstone.

2. A smaller, but more perfect specimen, in ironstone.

FIG. 3.

Is a small nodule of ironstone, holding a single pinnule or leaflet of the *Phyt. Osmunda regalis*, heretofore described.

T.34.



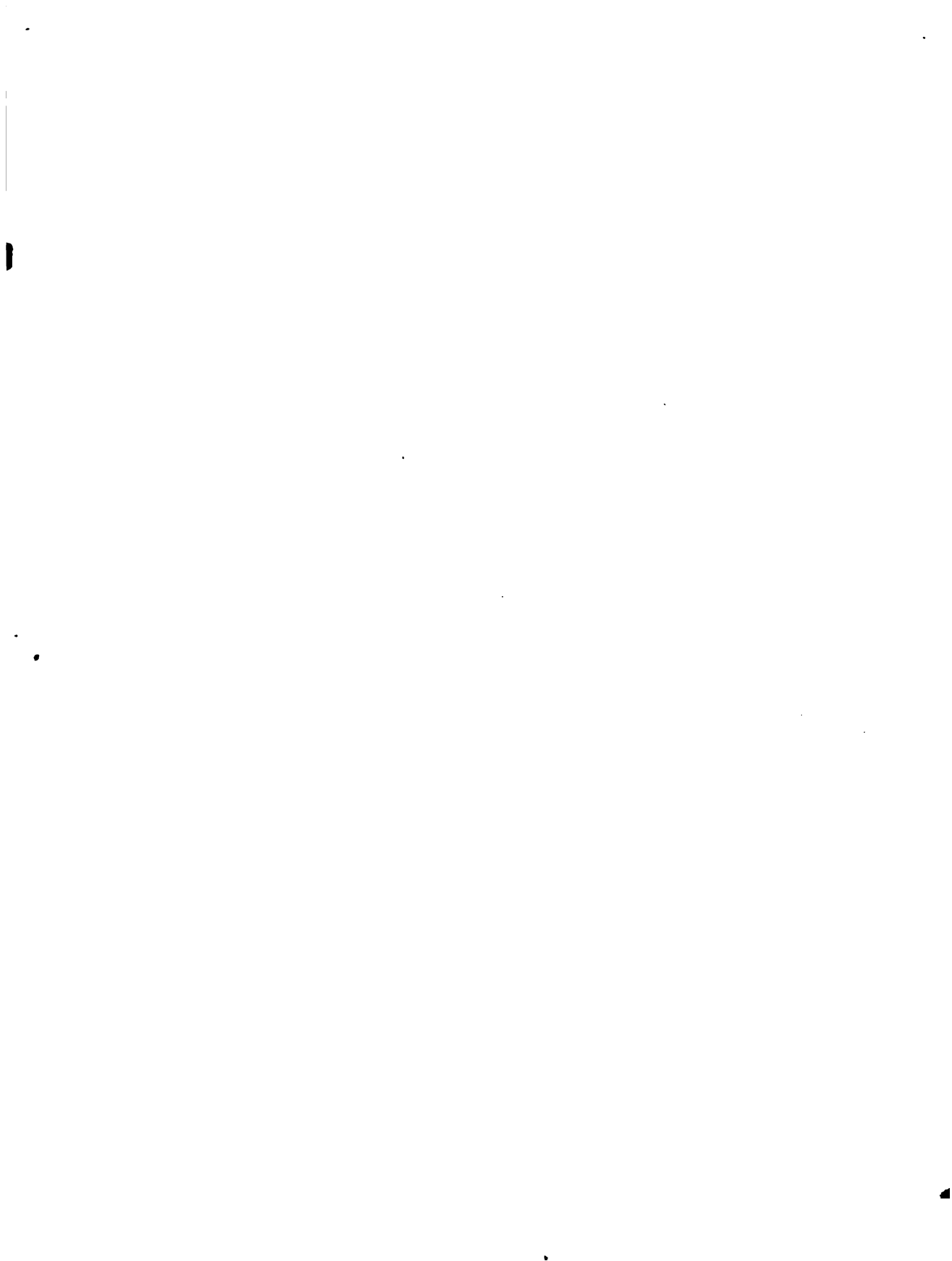




PLATE 35.

AMMONITÆ. LIMESTONE.

FIG. 1, 2.

CONCHYLIOLITHUS N. AMMONITES (*Luidii*) anfractibus extrinsecis teretibus: striis longitudinalibus elevatis denticulatis, disci centro pervio, dissepimentis integerrimis concavis. S. p.

A petrified shell. The original a *Nautilus*. Spiral, depressed. (See Syst. Gen. 6. Fam. *Ammonitæ*.) The volutions wholly external, or in no degree inserted into each other; round, tapering, and longitudinally striated; the striæ prominent, equal, accute, and denticulate. The number of volutions two*. Centre of the disk pervious. Dissepiments very entire, and concave. The siphuncle simple, placed near the back or outer part of the volutions.

A beautiful and rare species. The specimen figured, was found in a mine near *Ashford*.

FIG. 1 and 2 represent it in different positions.

* Perhaps more. In the only specimen I have seen, the outer volution appears to have been continued; but not beyond half a whirl further.

PLATE 35.

FIG. 3.

CONCHYLIO LITHUS N. AMMONITES (*Listeri*)
anfractibus subinsertis, ambitu depresso-convexo lato:
costis transversis bifidis, disco crateræformi costato:
tuberculorum serie marginali, dissepimentis sinuatis.
S. p.

A fossil shell. The original a *Nautilus*. Spiral, depressed. (Syst. Gen. 6. Fam. *Ammonitæ*.) Volutions slightly inserted. Ambit depressed, convex, broad, with transverse, bifid, slender, equal, close ribs. Disk crateræform, ribbed; surrounded by a single, marginal row of small rounded tubercles, from which the ribs take their rise. The dissepiments or partitions of the chambers sinuate; the siphuncle placed beneath, close on the back of each succeeding volution; its structure not ascertained.

A common species: it is found in most of our limestone tracts, particularly near *Eyem* and *Middleton*.

PLATE 35.

FIG. 4, 5.

CONCHYLIOLITHUS N. AMMONITES (*Woodwardii*)

anfractibus subinsertis: striis crenulatis longitudinalibus, ambitu subacuto: sulco lineari, disco angulo spirali, dissepimentis? S. p.

A fossil shell. The original a *Nautilus*. Spiral, depressed. (Syst. Gen. 6. Fam. *Ammonitæ*.) Volutions slightly inserted, striated; the striæ close, equal, longitudinal, and minutely crenate. Ambit somewhat acute, marked with a small, linear furrow. Disk concave, with an angle, following the course of the volutions. The form of the dissepiments and siphuncle unknown.

Rare. *Winster*.

FIG. 1, 2. A specimen in different positions.

PLATE 36, 37.

ANOMITE. LIMESTONE AND SPAR.

FIG. 1.

CONCHYLIOLITHUS ANOMITES (*trigonalis*) rotundo-trigonus, longitudinaliter sulcatus, sinu rotundato striato. S. p.

A fossil shell. The original an *Anomia*. Perforate, with convex valves. Hinge straight, extended, patulous, divided between the beaks by a triangular foramen, or aperture. The general form, or outline of the shell, trigonal, or three-cornered, with the angles rounded off; its surface longitudinally furrowed and sinuated; the furrows rounded; their number varying from twenty to thirty; the sinus continued, rounded, and extending the breadth of three or four furrows, hence striated like the other parts of the surface*. The beak of the larger valve is pointed, and generally much incurvated over the aperture; that of the smaller valve, short and obtuse.

This is the most common species of Anomite we have in Derbyshire: it is found more or less throughout our limestone, frequently constituting beds of a very large extent. It forms the mass of stone represented in our 29th plate. The

* This distinguishes *trigonalis* from *triangularis* and some other *Anomite* nearly allied in form, but in which the sinus is smooth, and may properly be considered as the central furrow, disproportionably larger than the lateral ones.

T. 36.



T. 37.



PLATE 36, 37.

present figure exhibits it detached, and is about the size of the more common specimens. It sometimes occurs considerably larger.

FIG. 2.

CONCHYLIOLITHUS ANOMITES (*triangularis*) trigonus, longitudinaliter sulcatus, sinu angulato lævi.
S. p.

Differs from *C. A. trigonalis*, principally in the sides being direct or straight, not rounded, forming acute angles with the hinge; and in the sinus, which is smooth and angular, instead of being rounded and striated, as in that species.

A much less common fossil than the foregoing, with which, however, it is sometimes found. Our specimens were collected near *Burton*. It rarely occurs in a perfect state; one or both of the corners, which the extended hinge forms with the sides, being for the most part broken.

FIG. 2. Represents a specimen thus mutilated.

PLATE 36, 37.

FIG. 3.

CONCHYLIO LITHUS ANOMITES (*lineatus*) transversim ovalis, decussatim striatus: striis longitudinalibus confertis subtilissimis; transversis remotioribus subelevatis majoribus, margine integro. S. p.

A fossil shell. The original an *Anomia*. Perforate, with convex valves, transversely oval. The hinge straight and patulous, but short, not extending the breadth of the shell. Foramen triangular; between the beaks. The surface of both valves decussatedly striated; the longitudinal striæ close, equal, and very minute, (scarcely visible without the assistance of a glass) the transverse broad, somewhat prominent, and more remote than the striæ which they cross; but with respect to themselves, approximate, or divided only by a small space from each other. The beak of the larger valve incurved and pointed; that of the smaller also pointed; and, though shorter than the other beak, more prominent than in most other *Anomita* of the same division. (See Syst. Gen. 6. d. *Anomita d. d.*) The margin is entire, having no indentations of any kind, except a very minute, and, in some specimens, scarcely perceptible, sinus, which does not in any degree affect the uniform convexity of the valves.

Common in limestone, particularly near *Castleton*.

PLATE 36, 37.

FIG. 4.

CONCHYLIO LITHUS ANOMITES (*Crumena*) scro-
tifformis, sulcis longitudinalibus subobsolescentibus,
margine sinu 3-plicato. S. p.

A fossil shell. The original an *Anomia*. Perforate. Valves convex, purse-like; or bellied and gradually increasing in size, from the beaks to the opposite extremity. Hinge curved, compact. Foramen oblong, very minute, (rarely visible) situate under the apex of the larger beak, which is sharp-pointed and incumbent. The surface of the shell longitudinally furrowed; the furrows few, not more than ten or twelve, deep at the margin, but gradually becoming indistinct, as they approach the beaks. The three central furrows form, in the smaller valve, a convex wave; answered, in the other valve, by a concave one; both terminating in a deep, three-plaited sinus at the margin.

Not so common as the foregoing. Our specimen from *Winstet*. Limestone.

This species, in form, approaches near to that division of *Anomite* which has the beak tubular and perforated at the point; and, without some attention, is readily mistaken for one of that tribe; particularly when the beak is broken and imperfect.

PLATE 36, 37.

FIG. 5.

CONCHYLIO LITHUS ANOMITES (*scabriculus*) sub-
rotundus, valvâ planâ obsoletè punctato-striatâ, alterâ
gibbosâ: striis elevatis longitudinalibus tuberculatis:
tuberculis oblongis subquincuncialibus. S. p.

A fossil shell. The original an *Anomia*. Imperforate, with one valve convex and gibbous; the other flat, or slightly concave. Hinge close, straight, extended. The outline, or general form of the shell, nearly round. The flat valve indistinctly marked with irregular, dotted lines; the convex valve with equal, prominent, longitudinal striæ, rising at regular distances into small, oblong tubercles, which are closely ranged, nearly in a quincunx order. The beak is obtuse and hooked over the hinge.

Not a very common species. It is found in the limestone, near *Tideswell*, and some other places.

FIG. 5. From the position does not well express the structure of the hinge, which is as much extended as in *semireticulatus*. (Tab. 32. fig. 1, 2, 3.)

PLATE 36, 37.

FIG. 6, 7, 8.

CONCHYLIOLITHUS ANOMITES (*punctatus*) rotundatus transversim striatus: striis remotis; interstitiis punctatis, valvâ alterâ gibbosâ, cardine subcurto. S. p.

A fossil shell. The original an *Anomia*. Imperforate. One valve convex and gibbous; the other concave. Hinge close, straight, but shorter or less extended than in the preceding species. The circumference of the shell rounded; its surface striated transversely; the striæ remote or distant from each other, and somewhat irregular and unequal; the spaces between them punctate, or dotted with hollow points. The beak is obtuse and rounded; and, generally, hooked over the hinge.

Common, particularly near *Buxton* and *Chelmerton*.

FIG. 6. A large specimen in brown limestone. The beak broken.

7, 8. A smaller specimen in grey limestone. The beak perfect.

PLATE 36, 37.

FIG. 9. 10.

CONCHYLIOLITHUS ANOMITES (*aculeatus*) subrotundus, valvâ concavâ lævi, alterâ gibbosâ retrorsum aculeatâ: aculeis raris-adpressis brevissimis, cardine subcurto. S. p.

A fossil shell. Original an *Anomia*. Imperforate, with one of the valves concave; the other convex and gibbous. Hinge close, straight, but less extended than in most other *Anomita* of the same division. (Syst. G. 6. *Anomita*. b. b.) The convex valve prickly; the prickles few, scattered, very minute, short, appressed or squeezed flat to the surface, and pointing backwards, or towards the beak. The beak small and hooked.

This is the least of our imperforate, straight-hinged *Anomita*. It is seldom larger than the specimen now represented; but frequently occurs much smaller. It is found near *Bakewell* and *Burton*.

FIG. 9. Shows the concave side of the specimen. The beak imperfect and broken, which gives it the appearance of being perforated with a large hole. This appearance is very common in the hooked beaks of the imperforate *Anomita*, and has been mistaken for a real foramen.

10. Represents the convex side of the same specimen.

PLATE 38, 39, 40, 41.

ORTHO CERATITÆ and other remains. *BLACK MARBLE,*
COMMON LIMESTONE AND SPAR.

P. 38—FIG. 1, 2.

CONCHYLIOLITHUS N. ORTHOCERATITES (*Gesneri*) elongatus conicus longitudinaliter sulcatus, dissepimentis integerrimis. S. p.

A petrified shell. Original a *Nautilus*. Elongated, straight, (see Syst. Gen. 6. Fam. Naut. d. *Orthoceratitæ*) conical, and longitudinally furrowed; the furrows equal, regularly concave, and close. Dissepiments very entire, approximate, or at no great distance from each other. The structure and situation of the siphuncle uncertain.

Found in the black marble, near *Ashford*, and, in other places, in common grey limestone, but less frequently than a succeeding species of the same tribe.

FIG. 1. A specimen somewhat compressed, consisting of black marble, the surface partially covered with white spar.

2. A smaller specimen in white limestone, perfectly round and conic; but, in a very small degree, bowed or bent towards one side.

PLATE 38, 39, 40, 41.

P. 38—FIG. 3.

CONCHYLIOLITHUS TURBINITES? (*constrictus*)
conico-turritus lævis, anfractibus supernè subcoarctatis: cingulo crenato marginali. S. p.

A fossil shell. The original a *Turbo*? Conically turreted, rising by regularly decreased volutions from the mouth to the apex, which is small and pointed. The surface of the volutions smooth; their number from eight to ten; the form of each at the bottom rounded; above (particularly in the three larger whirls) somewhat contracted: with a crenated narrow belt along the upper margin. The mouth is small, and seemingly round: but it has not been sufficiently perfect to determine the exact form and structure, in any specimen we have yet examined.

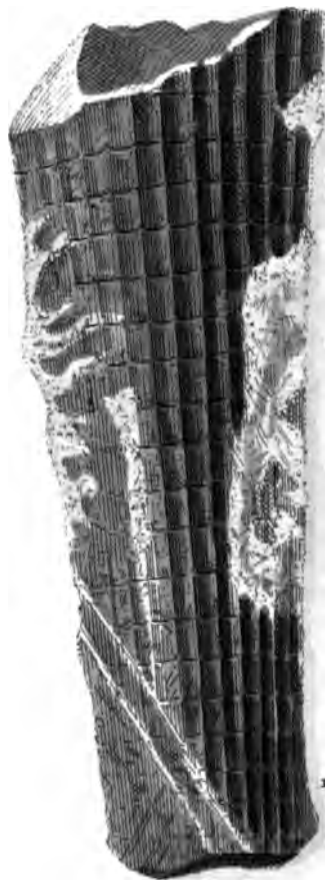
Not common. *Tisdewell*. The specimen figured, limestone.

P. 39—FIG. 4.

CONCHYLIOLITHUS N. ORTHOCERATITES (*Brey-nii*) elongatus conicus lævis dissepimentis subintegris, anticè undatis. S. p.

A fossil shell. The original a *Nautilus*. Elongated, straight, (Syst. G. 6. Fam. *Orthoceratitæ*) conical; its surface even; destitute of longitudinal furrows and striæ. Dissepiments approximate, concave, oblique, almost en-

T. 39.



3



2

T. 30.



PLATE 38, 39, 40, 41.

tire, having only a slight wave in front, or in that part of the shell near which the siphuncle is situate. The siphuncle simple, small, and cylindrical; placed between the centre and the edge of the dissepiments.

Frequent in the black marble at *Ashford*; and is also found sometimes in the common limestones.

FIG. 4. A specimen bedded in a mass of black marble. The lower chambers broken, so as to show their siphuncle or pipe of communication.

This species varies considerably in size. I have seen it more than two feet in length, and eight or nine inches in diameter, at the larger extremity: but its more usual size is that of the drawing.

The *crocodile*, said to have been found in the limestone at *Ashford**, appears to be nothing more than a particularly large specimen of this, or some other *Orthoceratite*: probably the species we have before figured in the 38th plate. The present Mr. Watson, of *Bakewell*, informs us, that, some years back, on showing a specimen of this fossil to his uncle Mr. Henry Watson†, he was assured by him, that it in no respect differed from what he had himself found and considered to be the *tail of a small crocodile*, as

* See Whitehurst's Theory of the Earth—Pilkinton's Derbyshire, &c.

† The first proprietor of the Marble Works at *Ashford*.

PLATE 38, 39, 40, 41.

mentioned by Mr. Whitehurst in his work on the Formation of the Earth, p. 184. As a further confirmation of the opinion we have formed respecting this supposed crocodile, we have to remark, that the men who now work in the marble quarries at *Ashford*, continue to call the *Orthocerata*, when they meet with them, *Crocodiles' tails*; agreeable to the idea which was first entertained on finding these bodies. It is to be regretted, however, that the specimen noticed by Mr. Whitehurst is not now in England;—a reference to it would at once have cleared up any doubt that may remain on the subject: but it was purchased, as I am informed, by a foreign collector, and is at present in the cabinet of one of the German princes.

P. 40—FIG. 1, 2.

CONCHYLIO LITHUS NAUTILITES? (*hiulcus*) subgloboseus imperforatus striatus; striis transverso-obliquis, ad ambitum lineâ unitis, aperturâ ampliâ, dissepimentis? S. p.

A fossil shell. The original a *Nautilus*. Involute, somewhat globose, imperforate, striated; the striæ close, acute, transverse, but oblique on the sides, and united by a single, narrow, dorsal line at the ambit. The mouth or aperture large, and somewhat extended on each side. The form and situation of the dissepiments are unknown.

T. 40.





PLATE 38, 39, 40, 41.*

Now and then found in our limestone, but not frequent.

FIG. 1. A specimen in brownish spar. The margin of the mouth broken: the striæ on the back indistinct.

2. Shows the back of another specimen in white spar: the striæ acute and perfect.

P. 40—FIG. 3, 4.

CONCHYLIO LITHUS HELICITES? (*auricularis*) umbilicatus auriformis subdepressus, subtus concavus, ambitu subacuto, apertura ovali, anfractibus duobus: superiore minutulo laterali. S. p.

A petrified shell. The original an *Helix**? umbilicate, ear-shaped, depressed, somewhat convex above; beneath concave. Ambit somewhat acute. Aperture large, oval.

T

* We have ranked this fossil, for the present, as an *Helicite*, but not without some doubt of the family to which the prototype may properly belong. The genus *Helix*, as established by Linne, is confessedly an incongruous one: many of its species agree neither in that particular part, from which the leading generic character is taken (*apertura coarctata, intus lunata f. subrotunda*:—*Syst. Nat.*) nor in their general habit; and are only connected by the merely artificial distinction of a more fragile and membranous structure than that of the other *testacea*: a characteristic wholly useless in discriminating the fossil subjects—and hence the difficulty of deter-

PLATE 38, 39, 40, 41.

Volutions only two; the lower one, disproportionably large; the upper one, very minute and lateral, or placed on one side.

Not common. The specimens figured, from *Bakewell*.

FIG. 3. Limestone. The smaller volution in this specimen broken.

4. A smaller specimen in Spar. Volutions perfect.

This shell appears nearly allied to the *Helix Haliotoidea*, and some other species of a like form; differing from the true *Haliotides*, principally in the want of the perforations which distinguish that genus.

mining whether a fossil univalve, possessing no generic distinction in its *form*, be one which Linne would or would not have classed as an *Helix*. It will be here, perhaps, observed, that as the order of *Testacea* consists wholly of *genera*, founded on artificial characters, taken from parts often wanting in fossil shells, the difficulty of ascertaining the genus of the originals, must frequently occur, even when the species petrified are evidently *not Helices*. To this we may answer, that in the Linnean arrangement of shells, the genera are mostly *natural*, though *artificially distinguished*—And that, as in all truly natural genera, the whole external appearance or *habit* is, for the most part, sufficiently indicative of the kind of body examined; no great difficulty will be found to attend the determination of the original genera in fossil shells (except in the instance already noticed) although the *teeth* and *mouth*, the parts on which Linne has established his arrangement of the recent subjects, are seldom visible in the petrified state.

PLATE 38, 39, 40, 41.

P. 41—FIG. 5.

CONCHYLIOLITHUS N. AMMONITES (*ingens*) an-
fractibus subextrinsecis teretibus lævibus, ambitu
integro, dissepimentis integris. S. p.

A fossil shell. The original a *Nautilus*; spiral, depressed. (Syst. G. 6. Fam. *Ammonitæ*.) Volutions three, nearly external, even, round, and gradually tapering to the centre, which is hollow or sunk beneath the level of the outward whirl. Ambit entire. Dissepiment entire, oblique, slightly waved. The structure of the siphuncle unknown.

Found near *Ashford*. Limestone.

This is the largest of the *Ammonitæ* yet discovered in Derbyshire. The specimen represented is about twice the size of the figure.

PLATE 42, 43, 44.

CORAL AND OTHER MARINE REMAINS.
CHERT, LIMESTONE, AND SPAR.

P. 42—FIG. 1, 2.

ERISMATOLITHUS TUBIPORITES (*catenatus*) aggregatus, ramis tubulatis lateralibus horizontalibus distantibus tubulos suberectos connectentibus. S. p.

Fossil coral. The original a *Tubipora*. Aggregate; the tubes or stirps equal, parallel, filiform, generally approximate, and nearly erect: each emitting from its sides distant horizontal tubular branches which enter the surrounding stirps, uniting the whole into one irregularly formed mass or group.

Now and then met with in the limestone, near *Winstor*. I have also found it at *Buxton*. It generally constitutes very large masses. The tubes sometimes five or six inches long. There are two varieties of this coral: in one the tubes are very slender and distant, which gives the mass an open, reticulated appearance: in the other the tubes are thicker and approximate, forming a closer or more solid group.

FIG. 1. Is a specimen of the first variety. Chert.

2. Exhibits a specimen of the other variety. Also chert. The matrix of both was limestone.

T. 42.





T. 43.



PLATE 42, 43, 44.

P. 43—FIG. 1, 2.

ERISMATOLITHUS MILLEPORITES? (*Flustriformis*)
plano-foliaceus reticulatus, poris minutis subobsoletis
sparsis. S. p.

A fossil coral. Original a *Millepora*? Plano-foliaceous, or flat, and thinly expanded, like a leaf; its form or outline uncertain*; its fabric open and reticulated, somewhat resembling, in structure, the corallines distinguished by the title of *flustra*. The surface of the fibres forming the reticulation, roughened with minute, indistinct, scattered pores; not, however, visible without the assistance of a magnifier.

Common in limestone about *Middleton*.

FIG. 1, 2. Are in grey limestone. The petrification itself a white, chalky spar. A magnified portion of one of these specimens will be found in Tab. 45. *.

P. 43—FIG. 3, 4. P. 44—FIG. 5.

ERISMATOLITHUS MADREPORITES (*floriformis*)
aggregatus, stirpibus scapiformibus prismaticis striatis
inæquilateris coadunatis, stellis confertis: centro sub-
exerto contorto. S. p.

U

* All the specimens I have yet collected appear to be only fragments or portions of the original.

PLATE 42, 43, 44.

Fossil coral. The original a *Madrepora*. Aggregate; the stirps scapiform, prismatic, unequal, coadunate* constituting, when the specimen is perfect†, a large, rounded, or somewhat nodular mass; its surface covered with angular stars. The columns or stirps increased a little in thickness from the base upwards; sometimes slightly flexuose; their sides longitudinally striated, unequal, and varying in number from five to seven. The stars are crowded and concave; their margins prominent and acute; their centres projecting, pointed, and writhed or twisted like a rope.

This species is not unfrequent in many parts of Derbyshire, where the limestone occurs, but is rarely to be met with entire: in general the specimens exhibit nothing more than detached parts of the original mass; and these not often in a perfect state. The twisted, prominent centre of the stars, which forms the principal characteristic of the species, is frequently wanting: and hence this fossil is liable to be confounded with several other *Madrepores*, which approach it in form and structure.

FIG. 3. A small specimen in chert, its cavities filled with quartz.

* But in most specimens separable.

† This seldom: and hence the form of the mass very rarely evident.

PLATE 42, 43, 44.

4. The upper part of one of the columns broken from the foregoing.

5. Another specimen in limestone. The figure shows only the side and base of the specimen.

P. 44—FIG. 7.

CONCHYLIO LITHUS ARCITES (*cancellatus*) sub-rhomboidalis decussatim æqualiter striatus, anticè obliquus angulatus natibus remotiusculis. S. p.

A fossil shell. Original an *Arca*. The hinge straight, extending the whole breadth of the shell. Valves equal, somewhat rhomboidal; their anterior extremity sloped and angular; the other end more rounded; the surface cancellated with longitudinal, and transverse, equal striæ. The beaks small, placed nearer the rounded extremity.

Not a common fossil. I have seen but few specimens of it, and those in limestone. That which is figured exhibits only one of the valves; the inside filled with stone.

PLATE 42, 43, 44.

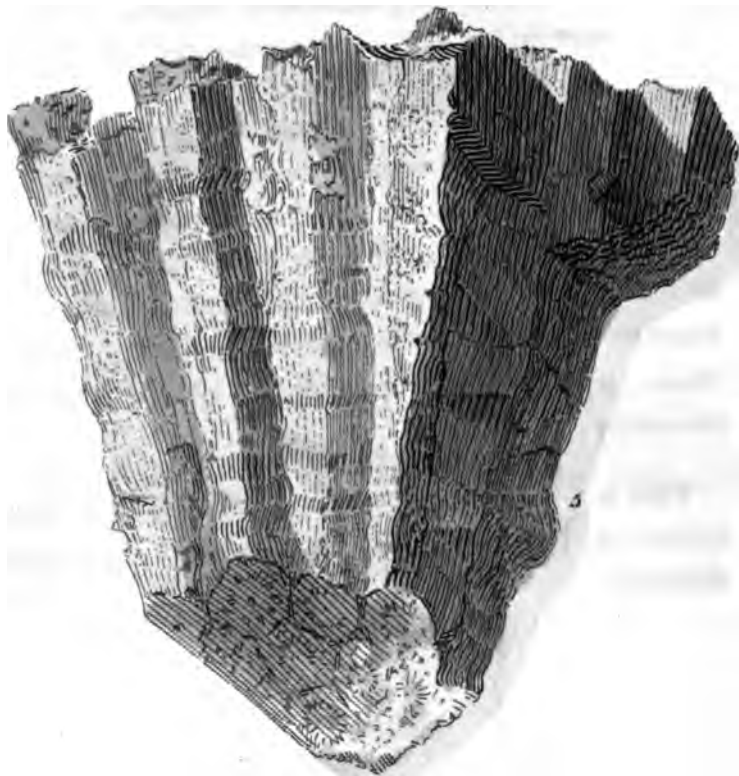
P. 44—FIG. 6.

CONCHYLIO LITHUS ARCITES (*rostratus*) subscaleniformis longitudinaliter striatus, anticè in rostrum rectum conicum læve protensus. S. p.

A fossil shell. The original an *Arca*. Hinge straight, extended. Valves equal, scaleniform. One end of the shell lengthened into a straight, smooth, conical rostrum; the other end short, gibbous, and marked from the beaks to the margin with very neat, equal and acute striæ: the margin in this part of the shell crenulated. The beaks are small, pointed and approximate, placed over the shorter extremity.

This is a very elegant and rare fossil. It is found in our limestone, but seldom entire. The specimen figured, from *Bakewell*.

T. 44.



T. 4. 5.



PLATE 45. 45*.

INSECTS. LIMESTONE.

P. 45—FIG. 1, 2.

P. 45*—FIG. 1, 2, 3.

ENTOMOLITHUS ONICITES (*Derbyensis*) oblongo-ovatus marginatus: margine integerrimo, dorso carinato: segmentis triarcuatis tuberculatis, capite gibboso: tuberculis duobus (oculis?) lunatis, caudâ integrâ. S. p.

A petrified insect. The original an *Oniscus*. The body oblong-ovate, broad and rounded at the head, smaller and more pointed at the tail;—convex, margined; the margin entire, or not divided by the segments of the back. Head or thorax * large, gibbous, equal in breadth to the abdomen; semicircular in front, with a broad, distinct, striated margin, joining that of the body; behind straight, separated from the back by a transverse line. The surface of the head longitudinally divided into three distinct parts: the middle one of these gibbous, rounded, and, when examined under a glass, apparently somewhat rough or scabrous. Between this part and the back, a small oblong protuberance, constantly surmounted by a single minute point or tubercle, which, however, is not visible without the assistance of a magnifier. The lateral portions of the

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* In the genus *Oniscus* the head and thorax are united.

PLATE 45. 45*.

surface of the head are nearly of a triangular form: each furnished, near the centre, with a large lunated tubercle; discovering, in perfect specimens, a reticulated structure, like that of the eyes in living insects, when magnified. The back of the insect is composed of strong, convex, tri-arcuate segments; their number varying from twenty to twenty-four; each marked with a line of very minute tubercles. The middle parts of the segments are more elevated than those on each side, and form collectively, down the back, a keel-shaped prominence, which ends somewhat obtusely, before it reaches the margin of the tail. The segments of the keel directly transverse, those on each side, particularly near the tail, somewhat oblique. The tail obtuse, entire, and destitute of any appendage.

The above described parts are all that are ever present in the fossil.—And as the under side is constantly filled with the stone which constitutes the matrix, it would be impossible to examine the legs and inferior parts of the abdomen, did they remain, which it is evident, however, they do not; the petrification being formed merely from the upper shell, or covering of the back and head.

This fossil is not frequent in many parts of the county. It is principally met with in the black marble at *Ashford*, where it very rarely occurs in a perfect state; the head and body being found, for the most part, separate from each other. The prototype appears to have been a gregarious

PLATE 45. 45*.

insect, as the petrification frequently offers itself in small groups of 20 or 30 specimens, lying within the compass of three or four inches of stone. These specimens exhibit more or less perfect fragments of the original, and are generally covered with a white, sparry matter, retaining minutely the structure of those particular parts from which it has received its form.

The lunated tubercles on the head were apparently inverted, in the recent subject, with a much thinner integument than the other parts of the insect. In perfect specimens the dark colour of the limestone is always seen through the present sparry covering of these protuberances; while the rest of the petrification, from the greater thickness of the crust, appears perfectly white and opaque. There can scarcely be a doubt, that the parts in question were the eyes in the living animal. Their form, as well as the evident difference of their native covering from that of the body, first led to this conclusion; but what places the matter almost beyond uncertainty, is their reticulated structure—This, with the help of a glass, is sufficiently visible: and we may observe, that such a structure, while it proves the nature of the parts where it is found, is also illustrative of the operation under which the mineral change has been effected—Since, only a *slow* and *gradual substitution* of fossil for organic matter could have preserved in the petrification a conformation thus minute.

PLATE 45. 45*.

The prototype of this very curious petrification is not at present known; but it doubtless belongs to the genus *Oniscus* *.

Tab. 45. Fig. 1. Fragments of *E. derbyensis*, as commonly found in black marble.

2. The body of a larger insect of the same kind in common limestone. The fossil rarely occurs as large as this specimen: its usual size is that of the fragments in the foregoing figure.

* The illustrious Linné considered his *Entomolithus paradoxus*, which though perhaps not the same species as our Derbyshire fossil, is very nearly allied to it, as a *Monoculus* (Syst. Nat. E. 12. p. 160.) His learned and ingenious editor Gmelin has not, however, followed his example. In the last edition of the *Systema Naturæ* we find the same fossil referred to the *onisci*: but here, under *paradoxus*, Gmelin probably confounds two, or more, distinct species. After mentioning *Dudley* and *Colebrookdale* among the localities of his fossil, he describes it, as covered with a lamellous shell, composed of versatile, triarcuate rings or segments—"testa laminosa ex annulis versatilibus triarcuatis composita"—which, as well as a precedent clause,—“Capite ---- supra ad latera hemisphæricis aut cylindricis duobus tuberculis notato,” perfectly well characterises the species common at both the abovementioned places. He afterwards, however, adds “Cauda tenui per tria tubercula tripartita.” This by no means agrees with the figures he refers to (his references are the same as in the 12th Ed. of the Syst.) nor with any of the numberless specimens we have had an opportunity of examining from *Colebrookdale* and *Dudley*. Doubtless, his description is accurate, as far as respects the fossil he himself has observed; but we think this must have been specifically distinct from the *Entomolithi* generally procured in Shropshire, Staffordshire, and Worcestershire, though agreeing with them in many particulars. “Cauda tenui,” &c. would apply to our *lunatus*, (Tab. 45. f. 4.) but the other parts of the description do not answer to it.

PLATE 45. 45*.

Tab. 45. *. Fig. 1. A perfect specimen magnified.

2. Another specimen of the head, more highly magnified to show the reticulated structure of the tubercles.

FIG. 3.—T. 45.

Is a very perfect specimen of the *Entomolithus paradoxus* from *Dudley*. The difference between the two fossils will be sufficiently manifest, on comparing this figure with the magnified one of *E. derbyensis* in Tab. 45. *.

FIG. 4.—T. 45.

ENTOMOLITHUS MONOCULITES? (*lunatus*) testâ
marginatâ anticè subretusâ, posticè lunatâ, caudâ
rectâ: stylo elongato simplici. S. p.

A fossil insect. Original a *Monoculus*? Its shell or covering semiorbicular, depressed, marginated: surface unequal: front subretuse, or terminating in a slight, blunt sinus:

Y

Whether the fossil distinguished, at present, by the title of *derbyensis*, be really distinct from the *E. paradoxus* of Linné, we can scarcely determine. It differs in the form of the head, and in the tubercles on the back, which have not been observed in *paradoxus*. But it is necessary to remark, that all the specimens we have hitherto seen of that species, collected at *Colebrookdale* and *Dudley*, have been merely casts; and the difference noticed, may possibly arise from their wanting the external covering, generally present in our Derbyshire Entomolithus. At any rate, it was thought more advisable to adopt a fresh trivial name, than to use the Linnean one, while the least doubt remained as to the identity of these fossil insects.

PLATE 45. 45*.

hinder part of the shell lunate : the angles very acute. The tail or posterior part of the body straight, rounded, and considerably less than the crescent-shaped covering from which it proceeds. It is divided by segments, somewhat similar to those on the back of *E. derbyensis*, and terminated by an undivided, subulate style, equal in length to the rest of the tail.

I am sorry, the rareness of this fossil in Derbyshire prevents me from giving a more accurate description. The specimen figured is in a nodule of ironstone ; it was found in argillaceous strata along with vegetable petrifications, on the borders of the county, I believe near *Mansfield*, and is the only one I have yet seen. It is not very perfect ; but sufficiently so to determine its specific difference from the *Entomolithus* before described. To this I have little to add, except, that the original appears to have approached nearer in size and figure to the *Monoculus Apus*, than to any other known recent species of that genus. Another note of agreement is its having been a fresh water, and not a marine insect, if we may judge by the strata, in which the fossil occurred, and the petrifications with which it was accompanied.

FIG. 3.—T. 45. *.

A magnified portion of *E. M. flustriformis* described at Tab. 43. Fig. 1, 2.

T. 45. 8



W. R. del. et sculp.

T. 46.



PLATE 46, 47, 48, 49.

ANOMITÆ. LIMESTONE AND SPAR.

FIG. 1, 2.

CONCHYLIOLITHUS ANOMITES (*Sacculus*) subscrotiformis lævis, margine obtuso, sinu exsculpto. S. p.

A petrified shell. The original an *Anomia*. Valves convex. Beak of the larger valve incumbent, tubulated, pierced at the apex with a minute, circular foramen. Hinge close, curved. The form of the shell purse-like; its surface smooth, except when marked, as in some specimens, with a few transverse, concentric furrows; its margin blunt, hollowed out, opposite to the beak, by an obtuse indentation, which is sometimes continued along the back of the beaked valve, in form of a very slight hollow furrow or wave.

Common in limestone, particularly near *Eyem* and *Middleton*.

FIG. 1, 2. Front and side view of the same specimen.

FIG. 3, 4, 5.

CONCHYLIOLITHUS ANOMITES (*cuspidatus*) longitudinaliter sulcatus, sinu rotundato, valvâ imperfo-

PLATE 46, 47, 48, 49.

rată semicirculari: nate incurvată, alteră pyramidită:
nate verticiformi subreflexă, foramine maximă. S. p.

A petrified shell. The original an *Anomia*. Perforate. Valves convex. Hinge straight, extended, patulous, triangular, divided down the middle by a very large, perpendicular foramen, in form of an acute isosceles. The surface of the shell longitudinally furrowed: The furrows strong, their number about 28 or 30, crossed by a few distant wrinkles, marking, apparently, the growth of the shell. A deep, rounded sinus, destitute of furrows, in the larger valve; answered by a convex wave on the other valve, and terminated by a strong curvature at the margin: Perforated valve pyramidal, perpendicular, gradually tapering from the margin to the beak, which is somewhat reflected and cuspidate, and constitutes, as it were, the apex or summit of the pyramid: the back, or that part of the valve proceeding from the margins, rounded: the opposite side flat, consisting of the hinge and foramen described above. The other valve semicircular, moderately convex, broad; its beak prominent, pointed, and incurved over the base of the foramen.

Very rare. Limestone. *Castleton*.

The structure of this *Anomite* is truly remarkable; differing from that of every other shell of the same tribe I have yet seen, except the next described species, and ano-

T. 47.



T. ph.



PLATE 10

PLATE 46, 47, 48, 49.

ther not figured in the present volume. These, by uniting the form of *A. cuspidatus* with that of the more common *straight-hinged perforated Anomita*, evince the propriety of placing them together, in the same division, which for some time I was doubtful of.

A few years back, I laid a description of this fossil before the Linnean Society (vide Linn. Trans. vol. 4. p. 4.) That description will be found to differ in some trifling respects from the one now given. For, as I had not then discovered the two species above alluded to, I was not aware of the gradation of form connecting this shell with its more common congeners; and, of course, considered it as a species constituting a distinct tribe or division of the genus. The gradation of form, I speak of, is first evident in *subconicus* (p. 47. f. 6, 7, 8.) In this shell we may observe, that the conic valve is less elevated or pyramidal, than in *cuspidatus*; consequently its apex, or, properly speaking, its beak is not so far removed from that of the other valve, and the hinge or flat side is smaller, approaching nearer to the form of this part in *triangularis* and *trigonalis*, pl. 47. fig. 6, 7, 8. In the other Anomite, which I have not as yet named or described, the hinge is still less, and the beak of the large valve, instead of being straight, is somewhat incurved, as in *A. triangularis*, with which it appears to have a close affinity, though perfectly a distinct species.

FIG. 3 represents a specimen, in grey limestone, of *A.*

PLATE 46, 47, 48, 49.

cuspidatus, showing the beak of the smaller, and the flat, perforated side of the larger valve.

4, 5. The same in different positions.

FIG. 6, 7, 8.

CONCHYLIO LITHUS ANOMITES (*subconicus*) longitudinaliter sulcatus sinu angulato, valvâ imperforatâ semicirculari, alterâ semiconicâ; nate rectâ apiciformi, foramine magnâ. S. p.

Differs from the foregoing in the particulars already mentioned; in the furrows, which are few in number, and acute; in having a central, angular fold, instead of a rounded wave in the margin; and in the beak of the conic valve, which is straight, or not recurved as in *cuspidatus*.

Very rare. Limestone. *Middleton*.

FIG. 6, 7, 8, are different views of the same specimen.

FIG. 9, 10.

CONCHYLIO LITHUS ANOMITES (*glaber*) transversim ovalis lævis, natibus approximatis, margine sinu obtuso. S. p.

Petrified shell. The original an *Anomia*. Perforate, with convex valves. Hinge straight, patulous, short. Foramen

PLATE 46, 47, 48, 49.

triangular, between the beaks. Outline of the shell transversely oval; its surface even, without furrows or striæ, and frequently polished and shining. The convexity in each valve nearly the same. Beaks approximate; that of the smaller valve short and obtuse; the other prominent, incurved, and more pointed. The margin deeply curved, giving to the larger valve a slight, and, in some specimens, scarcely perceptible concave wave, which is answered by a convex one, on the other side of the shell.

Common in limestone. *Chelmerton, Tideswell, &c.* It varies much in size, being found considerably larger, as well as smaller, than the specimen we have figured.

FIG. 11, 12.

CONCHYLIO LITHUS ANOMITES (*rotundatus*) sub-orbiculatus longitudinaliter sulcatus, margine sinu obsoleto. S. p.

A fossil shell. The original an *Anomia*. Perforate. Valves convex. Hinge straight, patulous, short. Foramen triangular. The general form of the shell somewhat orbicular, and in a slight degree compressed, as the convexity of the valves does not equal that, which is found in other *Anomitæ* of the same tribe. Valves longitudinally furrowed. Margin obtusely crenate, with a scarcely distinguishable sinus. The beak of the larger valve incurved.

PLATE 46, 47, 48, 49.

A small, and not a very common species. Limestone.
Middleton.

FIG. 11, 12 are front and side views of the same specimen.

FIG. 13, 14.

CONCHYLIO LITHUS ANOMITES (*resupinatus*) transversim ovalis longitudinaliter striatus: striis confertis æqualibus minutis, valvâ imperforatâ convexiore.
S. p.

A fossil shell. The original an *Anomia*. Perforate, with convex valves. Hinge straight, patulous, shortened. Foramen triangular. Valves transversely oval; their surface longitudinally striated; the striæ close, elevated, equal, minute, radiating from the beaks to the margin. The perforated valve slightly convex near the beak, even or flat towards the margin: the imperforated valve more convex, frequently gibbous, particularly at the beak. This structure, we may observe, is contrary to that of the other *straight-hinged perforate Anomites*, in which the valve containing the foramen is always the most convex. The beak of the perforated valve small, and pointed, somewhat prominent, but not curved over the aperture: the other beak larger, more obtuse, and equally prominent. The margin is quite entire, a very slight wave, only, being perceptible in some specimens.

T. 49.



PLATE 46, 47, 48, 49.

Not uncommon in most parts of the county where limestone is found; frequent in *Dovedale*.

FIG. 13. A specimen showing the flatter perforated valve.

14. The same, placed so as to show the hinge and beaks, with the upper part of the other valve.

FIG. 15, 16.

CONCHYLIO LITHUS ANOMITES (*acutus*) semicircularis longitudinaliter æqualiter striatus, margine crenulato: sinu magno angulato. S. p.

A fossil shell. Original an *Anomia*. Perforate. Valves convex, semicircular, marked with deep, longitudinal, equal striæ. Hinge patulous, straight, but not extending the whole breadth of the shell. Foramen triangular, large. Beak of the perforated valve prominent, pointed, incurved; the other short and obtuse. Margin acutely crenate, and furnished with a large angular sinus, causing a somewhat strong plicature on the surface of the valves.

Not frequent. Small. Limestone. *Winster*.

FIG. 15. A specimen showing the smaller valve, with the beak and perforation of the larger valve.

16. The same, placed so as to show the margin.

PLATE 50.

PHYTOLITHUS *imbricatus*, heretofore described. See P. 14.

I received this specimen from Lancashire *. It is introduced here to show the form and disposition of the scales in larger examples of the fossil, than those before represented, not having met with any of the same size as perfect in this county.

The ends of the specimen are broken ; and it is destitute of leaves, but there are vestiges of them in some small portions of the matrix, which still adhere to the scales. It consists of a hard, close, light-coloured grit—The surface varnished with a thin, black, bituminous or coaly matter.

* From Mr. John Collins, of *Wigan*, who has collected with considerable diligence the petrifications of that neighbourhood.

T. 50.



T. 51.



PLATE 51, 52.

A SEED-VESSEL, together with MINUTE SHELLS.
IRONSTONE.

FIG. 1, 2.

PHYTOLITHUS pericarpii* oblongi, ad basin triquetri, apicem versus compressi, longitudinaliter costati: costis æqualibus pluribus. S. t.

A petrified vegetable. The original a *Pericarp* or seed-vessel; oblong, smaller at each end, towards the apex compressed, triquetrous or three-sided at the base. The surface longitudinally ribbed; the ribs equal, numerous, slender, rounded, and somewhat distant, the intermediate spaces even and flat.

Very rare. Found near *Chesterfield* in argillaceous ironstone.

I have only met with a single specimen of this curious and interesting fossil. Another petrification with a somewhat similar form, and which at first I concluded to be the same species, has already been figured in plate 26, fig. 3. I believe, however, these fossils must be considered as perfectly distinct; for, exclusive of the difference of size, which is considerably greater than is usual in seed-vessels produced by any one species of plant, they do not appear to

* *Capsulae?*

PLATE 51, 52.

agree in their internal structure:—the specimen first noticed is furrowed on the inside, and seems to have had its cavity divided by longitudinal dissepiments:—in the present fossil the surface of the cavity is dotted with hollow points, and, as far as may be judged by a single specimen, the cavity itself is simple or one-celled. It will be difficult to determine with certainty, the kind of plant from which either of these petrifications has originated. The larger one, from its oblong angular form, has some resemblance to the capsule of the *Iris*; but its internal structure does not accord with that genus.

FIG. 1 represents the only specimen of *P. costatus* yet found in Derbyshire, formerly in Mr. Watson's collection at *Bakewell*. It consists of a somewhat conical nodule of iron-stone; on breaking which, one side of the lower part of the seed-vessel was laid bare, as exhibited in the drawing. On a further endeavour to detach the petrification from its matrix, the nodule was again broken, as shown in the next figure.

2. In this state the compressed form of the upper part of the petrification became evident; together with the internal structure of the lower part; the outside of the capsule being there broken away. The seeds were probably shed before any change of substance had taken place, as no vestige of them remains. On a close examination, however, a considerable number of *minute shells* are discoverable in

T. 52.



PLATE 51, 52.

the hollow of the fossil, which appear to have formed a lodgment in the capsule, after the seeds were discharged. They adhere firmly to the sides of the cavity, and are changed into ironstone, with the other parts of the specimen.

FIG. 3.

CONCHYLIO LITHUS HELICITES (*pusillus*) depressus lævis umbilicatus anfractibus teretibus, aperturâ subrotundâ. S. p.

A fossil shell. The original an *Helix*. Depressed, smooth, umbilicated, convex beneath. Volutions round and tapering; their number about three. Mouth roundish.

This minute species was found as already mentioned, in the seed-vessel just described. I have not observed it elsewhere. It resembles, in some respects, several of our land and fresh water *Helices*; but does not perfectly agree with any one species yet known.

FIG. 3 represents it magnified.

“ Derbyshire is well known as a country which exhibits, in the most
“ striking manner, the remarkable changes which our globe has suffered.
“ In every part of it, the most indisputable evidences appear of some great
“ and extraordinary revolution ; and there is not any place where extraneous
“ fossils, such as the remains and impressions of vegetables and animals, are
“ more abundant.”

HATCHETT. *Linn. Trans.* Vol. 4. p. 153.

A
SYSTEMATICAL ARRANGEMENT
OF THE
PETRIFACTIONS
DESCRIBED IN VOLUME THE FIRST:
WITH
ADDITIONAL REMARKS
ON SOME OF THE SPECIES.

* * We have, *for the present*, confined our enumeration of *Specimens* to such as arise from differences of *form*. The *constituent substances* of the petrification, though necessary to be noticed in a geological point of view, are not essential to the discrimination of the *species* or its *varieties*. (Vide Introduction. Art. Specimen. *Figure*. Constituent *Substance*, &c.)

☞ It will be evident to the reader, that the anglicised names of the petrifications given in the following arrangement, are not those in general use—Indeed, from the little attention hitherto paid the subject by common observers, scarcely any appellations, appropriate to the *species*, at present exist in our language—Those we have ventured on, are, with deference, offered for adoption, as the most expressive that occur to us.

PETRIFICATA DERBIENSIA.

ORDO I. ANIMALIA.

ENTOMOLITHUS.

* *Familiae permanentes.*

* b * *Oniscitæ.*

1. ENT. *Oniscites oblongo-ovatus*, margine integerrimo, dorso carinato: *Derbiensis*.
segmentis triarcuatis tuberculatis, capite gibboso: tuberculis duobus
(oculis?) lunatis, caudâ integrâ.

Tab. 45. Fig. 1, 2. Tab. 45. Fig. 1, 2.*

Derbyshire Oniscite.

Sedes: strata vetusta, sæpissimè calcaria.

In the black-marble quarries at *Ashford*—On *Bakewell Moor*, in rotten-stone.

SPECIMINA.

- b. *S. segmentis lævibus.*
c. *S. corpore pisiformi, onisci vivi instar contracto.*

Obs. Specimen *b.* with smooth segments, a *nucleus*: differs, therefore, only accidentally from the more common examples of the species—*c.* not often met with.

* c * Monoculitæ.

- lunatus.* 2. ENT. Monoculites? testâ marginatâ anticè subretusâ, posticè lunatâ, caudâ rectâ: stylo elongato simplici.
Tab. 45. Fig. 4.

Lunated Monoculite.

Sedes: strata vetula, argillacea, sæpè ferrifera.

In ironstone, near *Mansfield*, Nottinghamshire—and, as we have lately been informed, near *Chesterfield*.

HELMINTHOLITHUS.

* Familie permanentes.

* c * Stylastritæ Entrochitæ.

- levis.* 1. HELM. Styl. Entrochites stipitis articulis æqualibus: ambitibus lævibus planis, ramis alternis articulatis.
Tab. 2. Fig. 1, 2, 3, 4. Tab. 3. Fig. 5, 6, 7, 8. Tab. 24. Fig. 12.

Varietates.

- a.* V. articulis brevibus, ramis crassis. *Tab. 24. Fig. 1.*
b. V. articulis longioribus, ramis tenuissimis. *Tab. 2. Fig. 12.*

Even-jointed Entrochite.

Sedes: strata vetusta, calcaria.

In the grey-marble at *Monyash*—also in every part of the county where limestone is found.

SPECIMINA.

- a.* S. corpore stipiteque conjunctis.
b. S. stipitis disjuncti, ramis lateralibus.
c. S. stipitis disjuncti, ramis destituti.
d. S. stipitis disjuncti, foramine simplici rotundâ minutâ.
e. S. stipitis disjuncti, foramine obsoletè quinquepartitâ.

- f. *S. stipitis* disjuncti, foramine simplici maximâ.
 g. *S. articularum* disjunctorum. *Tab. 2. Fig. 2.*
 h. *S. stipitis* articulis trochlearibus. Nucleus. *Tab. 2. Fig. 4.*
 i. *S. tubulis* centralibus nudis. *Tab. 3. Fig. 5, 6.*

Obs. Specimens with the head and stipe united, as in a. are very rare in Derbyshire—I have never been fortunate enough to meet with them in this state myself, but have received a sketch, which was made from one, found in a block of marble at *Ashford*. Specimen b.—the stipe detached from the head or body, but furnished with branches, is the next more perfect form in which we find this fossil—The branches, however, seldom proceed from the stem above the length of three or four joints, before they are mutilated. Spec. d. in which the stipe is perforated with a minute, round hole, is common. It is occasioned by the central tube alone remaining visible of the six, which constitute the medullary part of the joints; those surrounding it, being filled up, and obliterated by the substance forming the petrification. Specimens similar to e. with the hole or *foramen* indistinctly five-parted, arise from the loss of all the tubes just mentioned. The large round hole in Spec. f. is produced by the loss or decay of the centre of the stem, as far as the circumference of the transverse plates, which connect the medullary tubes together (vide plate 3. fig. 6.) Specimens h. and i. are almost always found in chert.

2. HELM. Styl. *Entrochites stipitis* articulis æqualibus; ambitibus rotundo-convexis lævibus, ramis alternis. *prominens.*

Tab. 4. Fig. 9.

Convex-jointed Entrochite.

Sedes: strata vetusta, calcaria.

Found with the foregoing.

Obs. It has not yet been found united to the head: in other respects the specimens are similar to those enumerated of the *Even-jointed Entrochite*.

3. HELM. Styl. *Entrochites stipitis* articulis æqualibus: ambitibus rotundo-convexis tuberculatis, ramis —? *verrucosus.*

Tab. 4. Fig. 10.

Warted Entrochite.

Sedes: strata vetusta, calcaria.

Rare.

Obs. The specimen from which I took the figure above referred to, was found near *Bakewell*—I have since met with the fossil in a more perfect state, in the *Ashford* marble—together with



another Entrochite, which resembles it, in having each joint marked with a single row of tubercles, but differs in the form of the tubercles, which are more spine-like, and somewhat incurved. I do not propose this latter, however, as a mere variety of *verrucosus*, having little doubt of its proving a distinct species.

- annulatus*. 4. HELM. Styl. Entrochites stipitis articulis inæqualibus: ambitibus lævibus caput versus alternè planis convexisque, ramis —?
Tab. 4. Fig. 11, 12.

Varietates.

- a. V. articulis longioribus stipitis convexis regularibus. Tab. 4. Fig 11.
b. — — — — — planis regularibus. Tab. 4. 12.
c. — — — — — convexis irregularibus.

Ring-jointed Entrochite.

Sedes: strata vetusta, calcaria.

In most parts of the county where limestone occurs.

SPECIMINA.

- a. S. stipitis ramis destituti.
b. S. stipitis foramine simplici rotundâ.
c. S. stipitis foramine quinquepartitâ.
d. S. articularum disjunctorum.
e. S. stipitis articulis trochlearibus. Nucleus.

OBS. Nearly as common as *H. E. Lewis*, with which it is frequently seen forming the white figures in our *grey marble*. Those produced by *annulatus* are distinguishable by their indented margins, caused by the alternately flat and round ambits of the joints;—and by their pulley-shaped interior structure, which differs from that observable in sections of the *even-jointed entrochite*, in the angles of the joints being regularly divided into pairs, more or less distant, according to the size of the intervening joints.—In *H. E. Lewis*, the spaces between the angles are equal throughout the whole length of the stem.

Var. c. is distinguished from *a.* by the unequal size of the round-edged joints—every third or fourth being considerably larger, and with the ambit more convex and prominent, than the intermediate ones of the same form. *b.* is rather, perhaps, the remains of the branches of this species, than a proper variety.

CONCHYLIOLITHUS.

* *Familie permanentes.*

††. bivalvium.

* d * Myitæ.

1. CONCH. Myæ testâ ovatâ, natibus rugosis (cardinis dente primario crenu- *Myæ ovalis.*
lato: laterali longitudinali: alterius duplicato.)

Tab. 27. Fig. 1, 2. Tab. 23. Fig. 5.

Ovate Myite.

Sedes: strata vetula, argillacea, ferrifera.

In argillaceous ironstone at *Tupton-Moor.*

Obs. This fossil has not been observed in any other substance, we believe, in this county: in Lancashire it is not uncommon in gritstone: in Cheshire, we have also met with it, particularly near *Macclesfield*, in a blackish-grey, micaceous shale, accompanying coal.

* n * Arcitæ.

2. CONCH. Arcites subrhomboideus decussatim æqualiter striatus, anticè ob- *cancellatus.*
liquus angulatus, natibus remotiusculis.

Tab. 44. Fig. 7.

Latticed Arcite.

Sedes: strata vetusta, calcaria.

From the limestone near *Kniveton.* Rare.

3. CONCH. Arcites subscaleniformis longitudinaliter striatus, anticè in ros- *rostratus.*
trum rectum conicum læve protensus.

Tab. 44. Fig. 6.

Beaked Arcite.

Sedes: strata vetusta, calcaria.

Bakewell. Very rare.

* p * Anomitæ.

- * b. b. * Imperforati, valvâ alterâ planâ, *cardine* recto, extento,
coarctato.

giganteus. 4. CONCH. Anomites transversè oblongus lateribus dilatatus, longitudinaliter sulcatus striatusque: striis scabriusculis irregularibus, valvâ alterâ gibbosâ.

Tab. 15. Fig. 1.

Varietates.

a. V. striis sulcisque subflexuosis obsoletè tuberculatis.

b. V. — — — — rectoribus: tuberculis raris.

Gigantic Anomite.

Sedes: strata vetusta, calcaria.

In many parts of the county, particularly near *Burton*.

SPECIMINA.

b. S. subdecorticatum, punctis excavitis sparsis obsitum.

c. S. decorticatum læviusculum, valvâ convexâ gibbis quatuor instructâ: duabus latis prope natem: duabus magis elevatis marginem versus. Nucleus.

Obs. This species varies considerably in its form, as well as in its external markings. In *a*, the most common variety, the sides are generally more extended than in *b*, the furrows less regular, and in some specimens almost obsolete. The striæ, also, irregular and unequal, frequently crossing the furrows, instead of running parallel with them; and the tubercles, with which they are roughened, numerous and crowded, rising in most parts of the surface. In *b*, the striæ and furrows take a more regular form; while the tubercles, though less numerous, are generally more prominent than in *a*; and frequently found only on each side of the beak. Specimens of both varieties occur mostly in a shattered state, divested, more or less, of their proper crust, or that part of the fossil matter which has immediately taken the form and place of the external surface of the original shell. The larger valve, which alone remains in any degree perfect in the petrification, appears to have been very thick and strong, in the recent state, and to have consisted of several coats or layers: these, as far as may be judged by the fossil, were not externally imbricated, as in the structure of the common oyster, and many other bivalves, but were continued, each distinct and separable, from the hinge to the margin. In the petrification, these separate lamellæ form distinct crusts of stone, which, when broken, occasion the shattered, laminated appearance which most specimens of this fossil exhibit. The under layers have generally their surface sprinkled with hollow points instead of tubercles; and hence arise specimens similar to *b*. It is proper to remark, that this tunicated structure is not altogether peculiar to *giganteus*: we have observed it to take place sometimes in other *anomites* of the same division; particularly in *A. crassus* and *productus*. It is not constant, however, in any of these fossils; not even in the present species; as we have met with specimens, in which no appearance of it could be traced.

Specimen *c.* is the *nucleus* of the petrification, wholly divested of the coats or layers, and consequently exhibiting the interior form of the original—This, as in most *anomia*, appears to have been very remarkable—Near the beak of the *nucleus* arise two large, rounded gibbosities, one on each side, somewhat flattened, wrinkled on the surface, and surrounded by a strong furrow; beneath these, towards the margin, two others, generally less in diameter, but more convex or prominent, and with their surface smooth, without furrows or wrinkles. It is evident, that these prominences in the cast, must have taken their form from cavities on the inner surface of the original shell; the use of these cavities, however, it will be scarcely possible to ascertain—Perhaps those near the beak might contain the twisted *appendages* which are peculiar to the genus *anomia*, and which were first noticed, we believe, by Davila*, and described by him as two slender, gristly ligaments, proceeding from each side of the inner part of the beak, and returning to it again after various involutions. The furrows, surrounding the upper gibbosities of our fossil, are probably impressions from these *appendages*; or, at least, from some other bodies of a like nature. *Nuclei* similar in form are not uncommon to many other of the imperforated *anomites*.

5. CONCH. *Anomites subrotundus*, longitudinaliter sulcatus striatusque: *crassus*.
striis tuberculatis, valvâ alterâ subglobosâ.

Tab. 16. Fig. 2.

Thick-beaked Anomite.

Sedes: strata vetusta, calcaria.

Common in most parts of the county where limestone occurs.

Obs. The varieties in this fossil are nearly the same as in *giganteus*, from which, as before remarked, it scarcely differs but in size, and the want of the extended sides, which particularly mark that species. They both, perhaps, originate only from different growths of the same shell; but, as we have not, as yet, observed in any specimens the intermediate form, which must naturally ensue from this supposed difference of growth, we have thought it right to consider them, at present, as distinct species.

6. CONCH. *Anomites semiorbiculatus*, valvâ planâ decussatam striatâ, alterâ *semireticulatus*.
gibbosâ longitudinaliter striatâ, natem versus transversim rugosâ.

Tab. 32. Fig. 1, 2, 3. Tab. 33. Fig. 4.

Varietates.

- a.* V. nate valvulæ convexæ æquatâ.
b. V. — — — — — gibbo trilobato notatâ.

Semireticulated Anomite.



Sedes: strata vetusta, calcaria. Matrix sæpe petrosilex.

Common.

Oss. This is one of the imperforate *anomites*, with an internal structure similar to that observed in *giganteus*. In *V. b.* this structure has imparted to the surface of the fossil, near the beak, a small trilobate gibbosity, which is not found in *a.*

- punctatus.* 7. CONCH. *Anomites subrotundatus transversim striatus: striis remotis; interstitiis punctatis, valvâ alterâ gibbosâ, cardine subcurto.*
Tab. 37. Fig. 6, 7, 8.

Varietates.

- a. V. punctis confertis.*
b. V. — — raris.

Dotted Anomite.

Sedes: strata vetusta, calcaria.

Common near *Chelmerton*.

Oss. In *V. a.* the dots or punctures, between the striæ, are numerous, crowded, and without order: in *b.* few, distant, and disposed in two or three series. From recent observation, we are inclined to consider these dots as the bases of minute, slender spines, with which the original was armed, but which are seldom, if ever, visible in the fossil.

- aculeatus.* 8. CONCH. *Anomites subrotundus, valvâ concavâ lævi, altera gibbosâ retrorsum aculeatâ: aculeis raris adpressis brevissimis, cardine subcurto.*
Tab. 37. Fig. 9, 10.

Prickly Anomite.

Sedes: strata vetusta, calcaria, et rarò venæ metalliferæ.

In the limestone strata near *Bakewell, Buxton, &c.* We have also lately observed it in clay accompanying lead-ore, in some veins near *Middleton*; but, like all other real *petrifications*, it must be considered as very rare in such a situation.

- scabriculus.* 9. CONCH. *Anomites subrotundus, valvâ planâ obsoletè punctato-striatâ, alterâ gibbosâ: striis elevatis longitudinalibus tuberculatis: tuberculis oblongis subquincuncialibus.*
Tab. 36. Fig. 5.

Rough-backed Anomite.

Sedes: strata vetusta, calcaria.

We have lately seen some very perfect specimens of this fossil which were collected near *Wirksworth*.

10. CONCH. Anomites valvâ alterâ longitudinaliter striatâ gibbosâ productâ *productus*.
subcylindricâ alteram amplexante.

Tab. 22. Fig. 1, 2, 3.

Varietates.

- a. V. valvâ convexâ tuberculis raris aspersâ.
b. V. — — — — tuberculis destitutâ.

Lengthened Anomite.

Sedes: strata vetusta, calcaria.

Common in most parts of our limestone tracts.

Oss. It was only from repeated examination of numberless specimens, that we were able to acquire a just idea of the structure of this curious fossil. The stone, which constantly fills the lengthened cylindric part of the shell, precludes the possibility of ascertaining the form, or even the presence of the smaller valve, without breaking the specimen; and then it requires a careful comparison of the parts thus detached from different specimens, before the real conformation of the original becomes apparent.

We must observe, that the lengthened form of the large valve is not exclusively peculiar to this species: instances sometimes occur of *scabriculus* and *semireticulatus*, particularly the latter, affecting the same structure, but in a less degree; and we have now and then found them to divide (the produced part being filled with stone) in the same manner as *productus*. It is sufficiently evident, however, that this structure in *scabriculus* and *semireticulatus* is merely accidental, occasioned by the more than ordinary prolongation of the margin in particular specimens; while in the present fossil the prolongation is constant, and takes invariably the same form in each individual; thus constituting, without doubt, the leading characteristic of the species.

* d. d. * Perforati, valvâ utraque convexâ, cardine recto, ad valvam (plerumque) convexiorem patulo, et foramine trigonâ magnâ internates secto.

* a. a. a. * Cardine extento.

11. CONCH. Anomites rotundo-trigonus longitudinaliter sulcatus, sinu rotundato striato. *trigonalis*.



Tab. 29. Tab. 36. Fig. 1.

Trigonal Anomite.

Sedes: strata vetusta, calcaria.

In most parts of the county where limestone occurs.

*triangu-
laris.*

12. CONCH. *Anomites trigonus longitudinaliter sulcatus, sinu angulato lævi.*
Tab. 36. Fig. 2.

Triangular Anomite.

Sedes: strata vetusta calcaria.

Found with the foregoing, but less common.

striatus.

13. CONCH. *Anomites semiorbiculatus longitudinaliter undique striatus: striis approximatis elevatis subæqualibus, sinu rotundato parvo ad valvam perforatam subobsoleto.*

Tab. 23. Fig. 1, 2.

Striated Anomite.

Sedes: strata vetusta, calcaria.

Obs. This is the largest of our Derbyshire perforated *Anomite*—frequently four or five inches in breadth, immediately at the hinge.

subconicus.

14. CONCH. *Anomites longitudinaliter sulcatus, foramine magnâ, sinu angulato, valvâ imperforatâ semicirculari; altera semiconicâ: nate rectâ apiciformi.*

Tab. 47. Fig. 6, 7, 8.

Subconical Anomite.

Sedes: strata vetusta, calcaria.

Found in the limestone of *Middleton Dale*. Rare.

cuspidatus.

15. CONCH. *Anomites longitudinaliter sulcatus, foramine maximâ, sinu rotundato, valvâ imperforatâ semicirculari; alterâ pyramidatâ: nate verticiformi subreflexâ.*

Tab. 46. Fig. 3, 4. Tab. 47. Fig. 5.

Cuspidate Anomite.

Sedes: strata vetusta, calcaria.

Very rare. *Castleton.*

* b. b. b. * cardine curto.

16. CONCH. *Anomites semicircularis longitudinaliter æqualiter striatus, margine crenulato: sinu magno angulato. acutus.*

Tab. 49. Fig. 15, 16.

Sharp-waved Anomite.

Sedes: strata vetusta, calcaria.

Winster and Croom-hill, but not common at either place.

17. CONCH. *Anomites suborbiculatus longitudinaliter sulcatus, margine sinu obsoleto. rotundatus.*

Tab. 48. Fig. 11, 12.

Rounded Anomite.

Sedes: strata vetusta, calcaria.

Middleton and Hucklow. Rare.

18. CONCH. *Anomites transversim ovalis lævis, natibus approximatis, margine sinu obtuso-rotundato. glaber.*

Tab. 48. Fig. 9, 10.

Smooth Anomite.

Sedes: strata vetusta, calcaria. Matrix sæpè petrosilex.

Common.

Obs. The even and, in some instances, polished surface which this anomite exhibits, wholly without striae or any other markings, inclined me for a time to consider it as the *nucleus* of some unknown species; but, the frequent opportunities I have since had of examining the fossil, surrounded by the matrix, have convinced me, that the smoothness, which so remarkably characterises this petrification, has been received from the exterior surface of the original, and not, as in testaceous nuclei, from the polish common to the inside of shells.

Conch. Anom. *glaber* must be distinguished from another anomite of the same division, nearly resembling it in shape and the smoothness of its surface, but differing in its beaks, which are more distant or gaping. The loss of some perfect specimens has prevented a figure of this species from being given in the present volume; but its technical characters will stand as follows:

Conch. Anom. *hiens*.

C. Anomites suborbiculatus gibbosus lævis, natibus distantibus, margine sinu acuto-rotundato.

*resupina-
tus.*

19. CONCH. Anomites transversim ovalis longitudinaliter striatus: striis confertis æqualibus minutis, valvâ imperforatâ convexiore.

Tab. 49. Fig. 13, 14.

Varietates.

a. V. valvâ imperforatâ parùm gibbosâ.

b. V. — — — — valdè gibbosâ.

Reversed Anomite.

Sedes: strata vetusta, calcaria.

Common in limestone near *Middleton, Hucklow, Tideswell, &c.*

SPECIMINA.

b. S. superficie striis destitutâ. Nucleus.

Obs. We are under some doubt with respect to V. b. The difference between it and a. in the convexity of the imperforated valve, is so remarkable, that, at the first sight, no one would hesitate in pronouncing them to be distinct species; however, on a closer inspection, we find not only the general outline and structure to be the same, but also the minute work or markings on the surface; and this, it may be observed, frequently affords in shells more indubitable specific distinctions than even form—We have been induced, therefore, to consider the varieties in question as one species, though as before stated, with some degree of hesitation.

lineatus.

20. CONCH. Anomites transversim ovalis decussatim striatus: striis longitudinalibus confertis subtilissimis; transversis remotioribus subelevatis majoribus, margine integro.

Tab. 36. Fig. 3.

Varietas.

b. V. striis longitudinalibus subobsoletis; transversalibus approximatis.

Streaked Anomite.

Sedes: strata vetusta, calcaria.

Castleton, Hope, &c. Common.

* e. e. * Perforati, valvâ utrâque convexâ; *nate* valvæ majoris incumbente, sectâ infra apicem *foramine* exiguisimo, trigono aut oblongo; *cardine* coarctato, curvo.

21. CONCH. *Anomites cordiformis lævis*, marginis sinu longissimo cuneato. *acuminatus.*
Tab. 33. Fig. 5, 6. Tab. 32. Fig. 7, 8.

Acuminate Anomite.

Sedes: strata vetusta, calcaria.

Burton, Bakewell, Thorp, Brassington, &c.

22. CONCH. *Anomites subrotundus longitudinaliter sulcatus*: sulcis obsolescentibus, valvâ imperforatâ prope marginem gibbosâ, marginis sinu obtuso-rotundato magno 5-plicato. *Pugnus.*

Tab. 22. Fig. 4, 5.

Fist-like Anomite.

Sedes: strata vetusta, calcaria.

Common at *Castleton, Hope, Little-Longstone, &c.*

Oss. There are two other *anomites*, belonging to the same family as *C. A. Pugnus*, with similar plications in the sinus of the margin; and hence are liable, at present, to be mistaken for the same species—One, however, is distinguishable by its furrows taking an angular or plaited form, and by their being continued throughout to the beak—The other, by its oblong shape and the bottom of the imperforated or smaller valve, which is broad, but not gibbous as in *C. Pugnus*. Figures and descriptions of both these species will be given in our next volume.

23. CONCH. *Anomites scrotiformis*, sulcis longitudinalibus subobsolescentibus, marginis sinu 3-plicato. *Crumena.*

Tab. 36. Fig. 4.

Purse-like Anomite.

Sedes: strata vetusta, calcaria.

Moneyash, Winster, Cromford. Not so common as some other of the *Anomitæ*.



* f. f. * Perforati, *valvâ* utrâque convexâ; *nate* valvæ majoris *foramine* tubulato pertusâ; *cardine* coarctato, curvo. *Terebratulitæ*.

Sacculus. 24. CONCH. Anomites subscrotiformis lævis, margine obtuso: sinu exsculpto.

Tab. 46. Fig. 1, 2.

Varietates.

a. V. sinu à margine ad valvulæ perforatæ dorsum ducto.

b. V. sinu subobsoleto. Tab. 46. Fig. 1, 2.

Bag-like Anomite.

Sedes: strata vetusta, calcaria.

Eyem, Moneyash, Cronkstone, &c. Common.

Obs. Fifteen distinct species of *Anomitæ*, collected in Derbyshire, still remain in our hands unnoticed—Most of these we have met with since the drawings and descriptions for the present volume were finished. Five belong to the *Perforati*, *Fam. f. f.*, but only one there is any danger of mistaking for *Sacculus*—It may be distinguished by the following characters.

CONCH. Anomites attenuatus.

C. Anomites longitudinaliter ovatus lævis compressus, margine acuto integerrimo.

The *Anomitæ* are more numerous in this county than any other tribe of shells—and are, with the exception of two species, wholly confined to our limestone strata. The species alluded to are the *C. A. Gryphus* & *Pecten*—(*Helm. Gryphites* & *Helm. Anomites*. V. *Pecten*. Linn. Syst. Nat.) the former has been found in marl, in modern tracts, near Derby, the latter, in the shale of our coal-mines.

* j. * Pinnitæ.

nudus. 25. CONCH. Pinnites subflabellatus, sulcis longitudinalibus æqualibus rectis: interstitiis rotundatis lævibus.

Tab. 6. Fig. 1, 2.

Naked Pinnite.

Sedes: strata vetusta, calcaria.

Rare.

+++ univalvium.

* s.* Nautilitæ.

* a. a. * Involuti.

26. CONCH. Nautilites involutus umbilicatus globosus, ambitu integro, aper- *sphericus*.
turâ coarctatâ, dissepimentis dentato-sinuatis.

Tab. 7. Fig. 3, 4, 5.

Varietas.

- b. V. lateribus planiusculis.

Spherical Nautilite.

Sedes: strata vetusta, calcaria.

Castleton, &c.

SPECIMINA.

- a. S. umbilico obsoleto s. farcto.
b. S. suturis dissepimentorum obsoletis.

Oss. V. b. appears to exhibit a real variation in the structure of the original, and not an accidental form, arising, as at first sight might be supposed, from compression during the petrifying process.

S. b. with indistinct sutures most common—We have remarked, that the sutures are generally more evident in specimens consisting of black or dark-coloured marble, than in those found in the whiter kinds of limestone.

27. CONCH. Nautilites? involutus imperforatus subglobosus striatus: striis *hiulcus*.
transverso-obliquis; lineâ dorsali conjungente, aperturâ ampliata, dissepimentis — — — ?

Tab. 40. Fig. 1, 2.

Varietates.

- a. V. lineâ dorsali planâ latâ, striis acutis distinctis. Fig. 2.
b. V. linea dorsali parum convexâ latâ, striis subobsoletis confertis. Fig. 1.
c. V. lineâ dorsali tenuissimâ, cicatriculæ instar, striis confertis.

Wide-mouthed Nautilite.

Sedes: strata vetusta, calcaria.



Hartington, Crongstone, &c. but not common.

SPECIMEN.

b. *S. læve politum*, anfractibus internis manifestis distantibus. Nucleus.

Oss. This species varies greatly in its superficial markings—In *a.* the dorsal line is flat, in *b.* somewhat convex or raised, and in both broad and distinctly marked. In *c.* it is merely a slender and scarcely visible seam, in which the lateral striæ terminate. The striæ on the back and sides in *a.* are sharp, prominent, and somewhat distant from one another—In *b.* and *c.* they are very minute, indistinct, and crowded. The disposition of the striæ, and of the connecting dorsal line, as well as the general form of the shell, particularly about the mouth, are, however, the same throughout these varieties. To this we may add, that in a number of specimens the varieties are readily traced passing into each other; a sufficient reason for considering them only as one species.

Spec. *b.* is the *Nucleus* or cast this species gives, when the matter, which heretofore supplied the place of the original shell, has been destroyed—The interior volutions then become manifest: they are small, and form a few distant turns in the inner part of the cast. It may be distinguished from the *Nuclei* of some other involuted *Nautilitæ*, by its greater breadth at the mouth, and by the beak of the outer volution, which is somewhat angular or ridged.

We should remark, that we have not yet observed the concamerated, or chambered structure in this species, necessary to it as a *Nautilite*: there is little doubt, however, from its general habit, but it belongs to that tribe.

* *b. b.* * *Spirales*, anfractibus manifestis, depressis. *Ammonitæ*.

Luidii.

28. CONCH. Naut. *Ammonites* anfractibus extrinsecis teretibus: striis longitudinalibus elevatis denticulatis, disci centro pervio, dissepimentis integerrimis concavis.

Tab. 35. Fig. 1, 2.

Lhwydian Ammonite.

Sedes: vena metallifera. Tractus vetustus, calcarius.

Ashford. Very rare.

Oss. We have only met with one specimen of this fossil—It was found in clay, thrown out of a mine in the neighbourhood of *Ashford-in-the-Waters*—The substance of the petrification was calcareous, but of a softer quality and looser texture than our limestones and spars usually are in Derbyshire: from this, and from our never having yet observed any thing like the species bedded in strata, we conclude it to be truly venigenous.

Listeri.

29. CONCH. Naut. *Ammonites* anfractibus subinsertis, ambitu depresso-convexo lato: costis transversis bifidis, disco crateræformi costato: tuberculorum serie marginali, dissepimentis sinuatis.



Tab. 35. Fig. 3.

Listerian Ammonite.

Sedes: strata vetusta, calcaria.

Common.

30. CONCH. Naut. Ammonites anfractibus subinsertis: striis crenulatis longitudinalibus, ambitu subacuto: sulco lineari, disco angulo spirali, dissepimentis — — — ? *Woodwardii.*

Tab. 35. Fig. 4, 5.

Woodwardian Ammonite.

Sedes: strata vetusta, calcaria.

Rare. *Winster, Brassington.*

31. CONCH. Naut. Ammonites anfractibus subextrinsecis teretibus lævibus, ambitu integro, dissepimentis integris. *ingens.*

Tab. 41. Fig. 5.

Great Ammonite.

Sedes: strata vetusta, calcaria.

Black marble at *Ashford.*

* e. e. * Recti, ab apice ad basin concamerati. *Orthoceratitæ.*

32. CONCH. Naut. Orthoceratites conicus longitudinaliter sulcatus, dissepimentis integerrimis. *Gesneri.*

Tab. 38. Fig. 1, 2.

Gesnerian Orthoceratite.

Sedes: strata calcaria, vetusta.

Ashford.

33. CONCH. Naut. Orthoceratites conicus lævis, dissepimentis subintegris anticè undatis. *Breynii.*

Tab. 39. Fig. 4.

Breynian Orthoceratite.

Sedes: strata vetusta, marmorea, et schistosa.

At *Ashford*, in the black marble, and at *Burton*, in shale.

Oss. We have discovered several other species of *Nautilites* in this county. Two of these belong to the present division of *Orthoceratites*—one is a *Belemnites*—the rest *Ammonites* and *isolated Nautilites*—None of them are liable to be confounded with the species described in this volume.

* d. 2. * Turbinitæ.

- constrictus.* 34. CONCH. Turbinites? conico-turritus lævis, anfractibus supernè subcoarctatis: cingulo crenato marginali.

Tab. 38. Fig. 3.

Constricted Turbinite.

Sedes: strata vetusta, marmorea.

Tideswell, Burton, Huclow; but not common.

SPECIMEN.

- b. S. cingulo marginali obsoleto.

Oss. S. b. with the marginal belt indistinct, is found near *Burton*. This variety of structure is evidently accidental; occasioned by the roughness of the constituent limestone, which renders the crenations at the edge of the volutions scarcely distinguishable.

* c. 2. * Helicitæ.

- auricularis* 35. CONCH. Helicites? umbilicatus auriformis subdepressus subtùs concavus, ambitu subacuto, aperturâ ovali, anfractibus duobus: superiore minutulo laterali.

Tab. 40. Fig. 3, 4.

Ear-like Helicite.

Sedes: strata vetusta, marmorea.

Bakewell. Rare.

- Catillus.* 36. CONCH. Helicites depressus subtùs planus, suprâ concavus contractior, ambitu obtuso lato obliquo: marginibus acutis.

Tab. 7. Fig. 1, 2.

Dish-like Helicite.

Sedes: strata vetusta, marmorea, et schistosa.

Common.

SPECIMEN.

b. S. complanatum. In schisto nigro.

Obs. The flattened specimens of this fossil are not very frequent. Those we have found near *Buxton* are remarkably compressed; their thickness not exceeding that of a shilling. In this state, the part which forms the broad, oblique ambit, in the limestone specimens, constitutes, as it were, a flat or extended border to the outward whirl.

37. CONCH. *Helicites depressus lævis umbilicatus subtùs convexus anfractibus teretibus, aperturâ subrotundâ.* *pusillus.*

Tab. 52. Fig. 3.

Petit Helicite.

Sedes: strata vetula, argillacea, ferrifera.

Near *Chesterfield*. Rare.

ERISMATOLITHUS.

* *Familie permanentes.*

†. coralliorum cavernosorum.

* a * Tubiporitæ.

1. ERISM. *Tubiporites aggregatus, ramis tubulatis lateralibus horizontalibus distantibus tubulos suberectos connectentibus.* *catenatus.*

Tab. 42. Fig. 1, 2.

Varietates.

a. V. *reticulata, tubis distantibus.* Fig. 1.

b. V. *compacta, tubis contiguis.* Fig. 2.

Linked Tubiporite.

Sedes: strata vetusta, marmorea. Matrix sæpè distincta, ex petrosilice et quartzo composita.

Not uncommon in the limestone walls about *Ashford-in-the-Waters*.

radiatus. 2. ERISM. Tubiporites? aggregatus, dissepimentis transversis striato-radiatis tubos erectos striatos connectentibus.

Tab. 18. Fig. 2, 3.

Radiated Tubiporite.

Sedes: strata vetusta, marmorea.

Winsten. Rare.

* b * Madreporitæ.

* b. b. * Communes, stellis pluribus.

* a. a. a. * aggregati, stirpulis indivisis.

duplicatus. 3. ERISM. Madreporites aggregatus, stirpulis scapiformibus cylindricis striatis coadunatis, stellis margine dilatatis: centro subprolifero.

Tab. 30. Fig. 1, 2.

Varietas.

b. V. centro stellarum simplici.

Duplicated Madreporite.

Sedes: strata vetusta, marmorea.

Castleton, Hope, Bakewell, &c.

floriformis. 4, ERISM. Madreporites aggregatus, stirpulis scapiformibus prismaticis striatis inæquilateris coadunatis, stellis confertis: centro subexserto contorto.

Tab. 43. Fig. 3, 4. Tab. 44. Fig. 5.

Flower-like Madreporite.

Sedes: strata vetusta, marmorea.

Castleton, Middleton, &c.

SPECIMEN.

b. V. stellis centro obsoleto.

* f. f. f. * arbusculares, stellis terminalibus.

5. ERISM. Madreporæ aggregatæ, stirpulis fasciculatis cauliformibus subramosis striatis flexuosis coalescentibus, stellis turbinato-concavis reticulatis. *Madreporæ cespitosa.*

Tab. 17. Fig. 1.

Varietates.

- a. V. ramis cylindricis.
b. V. ramis subclavatis. Tab. 17.

Cespitose Madreporite.

Sedes: strata vetusta, marmorea.

Castleton, &c.

6. ERISM. Madreporites aggregatus, stirpulis cauliformibus subramosis lævibus subflexuosis, stellis concavis reticulatis. *affinis.*

Tab. 31. Fig. 1.

Affined Madreporite.

Sedes: strata vetusta, marmorea.

Winster and Hucklow. Rare.

* c * Milleporitæ.

7. ERISM. Milleporites? plano-foliaceus reticulatus, poris minutis subobsoletis sparsis. *flustriformis.*

Tab. 43. Fig. 1, 2. Tab. 45. *. Fig. 3.

Flustriform Milleporite.

Sedes: strata vetusta, marmorea.

Middleton, Burton, &c.

Obs. The original of this fossil appears to have been allied to the *Millepora reticulata*, Linn. The pores, as in that species, are confined to one side; but they are much smaller and less distinct. Whether the general form and manner of growth, in the two species, were in any respect similar, it is impossible to judge, as our *petrification* only occurs in small, detached portions, incorporated, as it were, with the substance of the limestone, which constitutes the matrix.



ORDO II. VEGETABILIA.

PHYTOLITHUS.

* *Familie permanentes.** c * *Filiciteæ.**striatus.*

1. PHYT. *Filicites* fronde bipinnatâ: pinnis ovato-oblongis: pinnulis lanceolatis integerrimis: nervis simplicibus confertis transversis.

Tab. 10. Fig. 1, 2, 3, 4.

Striated Filicite.

Sedes: strata vetula, argillacea, ferrifera. Matrix sæpè nodularis.

In ironstone near *Whittington, Staveley, Tupton, &c.*

SPECIMINA.

- b. S. pinnis disjunctis.
- c. S. stipitis pinnis destituti.
- d. S. pinnulis disjunctis.

Obs. This is among the most common of the vegetable petrifications, which occur in this county—A specimen of one of the separated pinna, as usually found in ironstone, is well represented in the fourth plate (fig. 1, 2.) of Parkinson's *Organic Remains*; who observes that Dr. Smith conjectures the original to have been a *Pteris*.

pseudo-regalis.

2. PHYT. *Filicites* fronde bipinnatâ: pinnis ovato-lanceolatis alternis patentibus: pinnulis ovalibus integerrimis.

Tab. 19. Fig. 1, 2, 3. Tab. 34. Fig. 3.

Varietas.

- b. V. pinnulis subrotundis parvis.

Pseudoroyal Filicite.

Sedes: strata vetula, argillacea.

Frequent with the foregoing.

SPECIMINA.

- b. *S. pinnis disjunctis*.
- c. *S. pinnulis disjunctis*.

Oss. We heretofore expressed a doubt of the identity of the original of this fossil and the *Osmunda regalis*, to which it is usually referred—An opportunity, we have lately had, of examining some very entire and perfect specimens, has convinced us, that a real, specific difference does exist between them: we have, therefore, exchanged the trivial name before given to the petrification, for one more appropriate; agreeable to the opinion we have now formed of the prototype.

3. PHYT. Filicites? fronde simplici auriformi subundulatâ: nervis dichotomis *auriformis*
subobsoletis a basi ad marginem extentis.

Tab. 34. Fig. 1, 2.

Ear-shaped Filicite.

Sedes: strata vetula, argillacea.

Alfreton and Chesterfield. Rare.

* e * Plantitæ.

4. PHYT. Plantites trunco subcylindrico subramoso tuberculato: tuberculis *verrucosus*.
suppressis quincuncialibus, foliis confertis horizontalibus lineari-lanceo-
latis.

Tab. 11. Fig. 1. Tab. 12. Fig. 2. Tab. 13*. Fig. 2*.

Varietates.

- a. V. tuberculis mammillaribus.
- b. V. ——— depressis punctularibus.
- c. V. ——— depressis annulatis: centro prominulo acuminato.

Verrucose Plantite.

Sedes: strata vetula, arenaceo-argillacea. Matrix sæpissimè arenaceo-silicea.

Alfreton, Chesterfield, Padley, &c. Common.

SPECIMINA.

- a. *S. sulco ad latus planius trunci, corpus medullare cylindricum imbricatum occultante.*
- b. *S. trunci sulco et medullâ destituti.*



- c. *S. trunci foliis destituti.*
- d. *S. trunco simplici.*
- e. *S. ——— complanato.*

Oss. This petrification presents great diversity of form, which does not, however, appear to arise from any dissimilarity of structure in the original, if we except that, which the various shapes of the tubercles produce. The difference noticed in the specimens, a. b. c. &c. is merely accidental, occasioned by the more or less perfect state in which the fossil occurs.

Since this work went to the press, we have received a copy of Mr. Parkinson's "Organic Remains," in which we find an excellent figure and description of the petrification now under investigation. In the first instance, Mr. Parkinson considers this *Reliquium* as we have done—that is, as the remains of the stem of a plant, which has not, as yet, been discovered; but is inclined afterwards to alter this opinion, on inspecting specimens of a *Phytolithus*, conceived to be analogous to the present fossil, though evidently a petrified strobile or cone, from some unknown species of *Pinus*.

That the specimen figured by Mr. Parkinson, plate ix. f. 1. is really the petrification of a cone there can be no doubt—we have frequently met with the same fossil, and, if we are not mistaken, once examined the very specimen, from which the figure above referred to was taken; but our observations have by no means led us to conclude, with this Gentleman, that *Phyt. verrucosus* also originates from a *strobilus*. Its size * alone strongly makes against this idea; and we have to add, that, among the numberless specimens examined by us, not the smallest vestige has been discovered, of that connection between the surface and the central imbricated part, noticed by Mr. Parkinson in his described *strobilus*: although many of these specimens of *verrucosus* were in *ironstone*; in which state, the structure in question would most probably have been preserved, had it existed in the original. Woodward, who had, as Mr. Parkinson justly observes, from the multitude of his specimens, the best opportunity for judging correctly of the nature of this curious fossil, was decidedly of opinion, that its original was the trunk or stem of some unknown plant: and that the imbricated body, frequently discovered running lengthways through the petrification, was no other than the commencement of a branch—His words in describing one of his specimens are, "Another from *Lanelthy*—This has running lengthways of it a pretty deep Creest" (*sulcus*), "and, in it, a body that at one end is extant, and appears in the Creest: but at the other is immersed'd in the stone so as there to resemble what I have mentioned in h. 40. as a pith: and 'tis probably the same with that. This appears as a branch arising out of the main trunk: and indeed is no other." &c.—Vide Cat. Engl. Foss. T. 11. p. 60. h. 41.—This subramose structure, clearly pointing out the nature of the prototype, we had ourselves ascertained in several specimens, examined as they lay in their native beds, long before we had had an opportunity of

* Woodward notices specimens five or six feet long. Vide Cat. Engl. Fossils. V. I. p. 104. q. 1. V. II. p. 59. h. 34. One of these was found near *Higham*, (Derbyshire) from whence we have also received very large specimens.

consulting Woodward's work; and, of course, without any previous bias in favour of his opinion on this subject. If, however, a confirmation of that opinion was still wanting, we conceive, the *leafy clothing*, recently discovered by us in this fossil, affords one sufficiently decisive; and have no doubt but Mr. Parkinson, who is evidently anxious after truth, will now readily admit our determination, respecting the original of *Phyt. verrucosus*, to be correct, notwithstanding the internal structure of the *stem* differs so much, from what has ever yet been ascertained in living plants.

5. PHYT. *Plantites trunco tereti squamoso: squamis rhomboideis subcarinatis imbricatis, foliis confertis subulatis.* *imbricatus.*

Tab. 14. Fig. 4, 5. Tab. 50.

Imbricated Plantite.

Sedes: strata vetula, argillacea, sæpè ferrifera.

Alfreton, Chesterfield, &c. Common.

SPECIMINA.

- b. *S. expletum trunci foliis destituti.*
c. *S. complanatum trunci foliis destituti.*

Obs. Flattened specimens of this *Phytolithus* (c. *S.*) are frequent in the coal, near *Buxton*.

6. PHYT. *Plantites caule simplice tereti striato, foliis linearibus verticillatis.* *stellatu.*
Tab. 20. Fig. 4, 5, 6.

Stellate Plantite.

Sedes: strata vetula, argillacea, sæpè ferrifera.

Alfreton, &c.

* * *Familie temporales.*

† † *Reliquia fructualia. Carpolithi.*

7. PHYT. *Fructûs, nuce ovatâ acuminatâ trigonâ basi parùm derasâ.* *acutulinus*
Tab. 21. Fig. 1, 2, 3, 4, 5, 6.

Sharp-pointed Fossil-nut.

Sedes: strata vetula, argillacea, sæpè ferrifera.

In the gritstone quarry, near *Bakewell*. Rare.

SPECIMINA.

a. *S. nucis denudatæ.*b. *S. nucis corticatæ.* Specimen rarissimum.*costaticapsulis.*

8. PHYT. Pericarpium oblongi basi triquetri, apicem versus compressi: costis æqualibus pluribus longitudinalibus.

Tab. 51. Fig. 1. Tab. 52. Fig. 2.

Ribbed Fossil-capsule.

Sedes: strata vetula, argillacea, ferrifera.

Chesterfield. Very rare.*sulcicapsulis.*

9. PHYT. Pericarpium conico-oblongi acuminati internè sulcati: sulcis æqualibus profundis longitudinalibus.

Tab. 26. Fig. 3.

Internally-sulcated Fossil-capsule.

Sedes: strata vetula, argillacea, ferrifera.

Chesterfield. Rare.

Obs. No description of this species has been given with its figure, under the idea that it was merely a variety of the foregoing—This, we are now convinced, is not the case; the specific character, however, will sufficiently distinguish the fossil.

† † † † Reliquia truncalia.

* a * —culmalia.

sulciculmis.

10 PHYT. Culmi cylindrici simplicis: articulis longitudinaliter sulcatis.

Tab. 8. Fig. 1.

Sulcated Fossil-culm.

Sedes: strata vetula, sæpè arenaceo-argillacea.

Common in most parts of the county where the argillaceous gritstone occurs.

SPECIMINA.

b. *S. sursùm attenuatum.* Apex Culmi.c. *S. complanatum.*d. *S. articuli solitarii.*

11. PHYT. Culmi teretis simplicis: articulis longitudinaliter striatis: striis *striaticul-*
æqualibus confertis. *mis.*

Tab. 25. Fig. 1. Tab. 26. Fig. 2.

Striated Fossil-culm.

Sedes: strata vetula, argillacea.

Not uncommon with the foregoing species.

SPECIMINA.

b. S. complanatum.

c. S. articuli solitarii.

Obs. The single joints of both this and *sulculmis* generally occur in ironstone; they are, however, rare. The flattened specimens are commonly of shale.

* c * —caudicalia.

* a. a. * —corticalia.

12. PHYT. Caudicis? undatim cancellato-striati: squamâ parvâ subrhombâ *cancelli-*
in omni interstitio. *caudex.*

Tab. 13 Fig. 3.

Cancellated Fossil-stem.

Sedes: strata vetula, argillacea.

Buxton, &c.

Obs. This fossil seems nearly allied to *Phyt. imbricatus*; but cannot be placed with the *permanent species*, as the structure of its foliage, if any, is at present unknown. We have never yet met with it in any other, than in the complanated or flat state.

* b. b. * —lignalia.

13. PHYT. Caudicis texturâ ligni quercei.

SPECIMEN. Mat. siliceum. *Lythorylon* siliceum.

Tab. 1.

Oak-like siliceous Woodstone.

Sedes: ut plurimum aquariæ, interdum irregularia sabuli strata, rarò rimæ.

Tractus nunc vetustus, nunc vetulus, nunc recens vel recentissimus.

quernilig-
nis.

In water-courses; sometimes in the veins in the limestone strata near *Worksworth, Bakewell, &c.* It also occurs, we have been informed, in gravel pits about *Derby*.

† † † † †. Reliquia radicalia. *Rhizolithi*.

corticiradix.

14. PHYT. Radicis teretis simplicis transversim rugatæ, corticeque crassâ æquâ obductæ.

Tab. 9. Fig. 2, 3.

Thick-coated Fossil-root.

Sedes: strata vetula, arenaceo-argillacea.

Chapel-in-the-Frith, Bakewell, &c.

SPECIMINA.

b. S. semiforme.

c. S. expletum decorticatum.

d. S. complanatum decorticatum.

Oss. Specimens without any vestige of the coat or bark are most common.

compressiradix.

15. PHYT. Radicis simplicis oblongæ compressæ: rugis longitudinalibus.

Tab. 9. Fig. 4.

Compressed Fossil-root.

Sedes: strata vetula, arenaceo-argillacea.

Found with the foregoing.

Oss. Roots are rare among petrifications; and we were for sometime doubtful, if we ought to rank the above species as such; but, the great number of specimens we have met with, since this work began to be published, retaining constantly the same characters and appearances, leaves no room for hesitation in pronouncing them to be genuine *Rhizolithi*, although the trees to which they have belonged remain unknown.

END OF VOLUME FIRST.

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